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EXPORTS of HORNED CATTLE to the various FOREIGN COUNTRIES during the FISCAL YEAR ended JUNE 30, 1878.

Order.	Countries.	Value.	Per cent.
		$	
1	United Kingdom	2,408,843	61·81
2	Cuba	683,563	17·54
3	Provinces of Quebec, Ontario, &c.	442,092	11·35
4	British West Indies and British Honduras	119,734	3·07
5	Germany	87,648	2·25
6	Belgium	67,850	1·74
7	France	35,700	·92
8	All other countries	51,388	1·32
	Total	$3,896,818	100·00

Nearly 62 per cent. of the cattle exported were shipped to Great Britain, 17½ per cent. to Cuba, and 11 per cent. to British Possessions in North America.

EXPORTS of CATTLE to GREAT BRITAIN from 1874 to 1878, inclusive.

Year ending June 30—	Number.	Value.
		$
1874	123	113,800
1875	110	73,000
1876	244	31,220
1877	5,091	546,829
1878	24,982	2,408,843

B.

[Circular.]

EXPORTATION of CATTLE to GREAT BRITAIN.

Treasury Department,
TO COLLECTORS OF CUSTOMS AND OTHERS, Washington, D. C., December 18, 1878.

THE following Despatch has been received by cable, through the Department of State, from Liverpool:

" Unless cattle shipped from United States have Government health-certificate when embarked, slaughter probably compulsory on landing, paralyzing trade. Can you cable Welsh assurance appointment veterinary officers at seaports ? "

You are authorised to cause an inspection to be made of all neat cattle proposed to be shipped from your port to Great Britain, and to issue your certificate that such cattle as shall be shipped are free from all disease, and that there is no known disease in cattle at your port, or in its neighbourhood.

In States in which there are officers authorised by law to examine into the diseases of cattle, the collector may avail himself of their services, as the basis of his action, at the expense of the shippers.

Very respectfully,
(Signed) H. F. FRENCH,
Assistant Secretary.

C.

[Circular.]

INFORMATION in regard to CATTLE DISEASE.

Treasury Department,
TO COLLECTORS OF CUSTOMS AND OTHERS, Washington, D. C., Feb. 1, 1879.

BY department's circular of December 18, 1878, it was directed that live cattle shipped from the various ports of the United States might be examined with reference to the question whether they were free from contagious diseases, and that, if found to be free from such diseases, a certificate to that effect should be given.

By that circular such inspection was not made compulsory, but the certificate was to be issued only upon the application of parties interested.

As the export trade in live cattle from the United States is of vital importance to large interests, every precaution should be taken to guard against the shipment of diseased animals abroad, and such a guarantee given as will satisfy foreign countries, especially Great Britain, that no risk will ensue from such shipments of communicating contagious or infectious diseases to the animals in foreign countries by shipments from the United States.

Collectors of Customs are, therefore, instructed that in no case will live animals be permitted to be shipped from their respective ports until after an inspection of the animals with reference to their freedom from disease, and the issuance of a certificate showing that they are free from the class of diseases mentioned.

Notice of rejected cattle should be promptly given to this department.

In order that this department may be fully informed in regard to such diseases in any part of the United States, collectors of customs are requested to promptly forward to this department any information which they may be able to obtain of the presence of contagious or infectious diseases prevailing among live animals in their vicinity.

It is probable that if the disease prevails to any considerable extent it will be noticed in the local press, and collectors are requested to send copies of any such notices to this department for its information.

(Signed) JOHN SHEARMAN,
Secretary.

No. 3.

LETTER from the BRITISH CONSUL-GENERAL at NEW YORK to the MARQUIS OF SALISBURY.

(No. 21, Consular.)
British Consulate General, New York,
March 4, 1879.

MY LORD,

I HAVE the honour to report to your Lordship that pleuro-pneumonia among horned cattle still exists on Long Island, and is reported also to exist on Staten Island, and two or three other localities in the neighbouring counties.

Vigorous measures towards extirpating the disease are being enforced, in compliance with the law, and under the instructions of the Governor of this State.

A few isolated cases are said to exist in New Jersey, but the States of Connecticut, Rhode Island, and Delaware, are reported to be free from it.

I have, &c.
(Signed) E. M. ARCHIBALD.

The Most Honorable
The Marquis of Salisbury, K.G.
&c. &c. &c.

No. 4.

LETTER from FOREIGN OFFICE to the CLERK OF THE COUNCIL.

Foreign Office, March 6, 1879.

SIR,

WITH reference to your letter of the 27th ultimo, I am directed by the Marquis of Salisbury to transmit to you, to be laid before the Lords of Her Majesty's Privy Council, a further note from the United States Minister in this country, praying for a reconsideration of the action recently taken by their Lordships in regard to the importation of live cattle into this country from America. I am to request that Mr. Welsh's note may be returned with your reply.

I am, &c.
(Signed) T. V. LISTER.

The Clerk of the Council,
&c. &c. &c.
Veterinary Department.

Enclosure in No. 4.

LETTER from the UNITED STATES MINISTER, LONDON, to the MARQUIS OF SALISBURY.

Legation of the United States,
London, February 28, 1879.

MY LORD,

PARDON me for again addressing your Lordship on the subject of the live cattle trade which promised to be of so much importance to England and the United States, and which, unless the late action of the Privy Council shall be modified, will be brought to an end on the 3rd proximo.

The authorities of several of the States most interested in the matter, as well as the Federal Government, have taken such prompt and vigorous measures for the extirpation of disease should it be suspected to exist, and have required so rigid an examination by experts, before shipment, that the danger of pleuro-pneumonia, or indeed any other serious ailment, has been reduced to a minimum.

I cannot but hope, therefore, that Her Majesty's Government will see fit not to depart from the policy hitherto pursued and which has resulted so favourably.

Until the arrival of the steamship "Ontario," although up to 31st of October 1878, more than 96,000 cattle from North America had been landed alive, and no cases of disease had occurred, and since her arrival 25 steamers from the United States have reached Liverpool with 3,237 head, all of which have passed inspection and 421 head now landing by the "City of Bristol," from Philadelphia await inspection. The circumstances connected with the "Ontario" shipment, which I have heretofore explained to your Lordship, were such as to make it more than doubtful whether the disease among her cattle originated in the United States, and what I have now stated will satisfy you, I trust, that it is unwise to alter, on account of it, the policy of Her Majesty's Government towards the United States.

I have, &c.
(Signed) John Welsh.

The Most Honorable
The Marquis of Salisbury,
&c. &c. &c.

No. 5.

LETTER from the DEPUTY CLERK OF THE COUNCIL to the UNDER SECRETARY OF STATE, FOREIGN OFFICE.

Sir, March 8, 1879.

I have submitted to the Lords of Council your letter of the 6th instant, transmitting a further note from the United States minister in this country praying for a reconsideration of the action recently taken by their Lordships in regard to the importation of live cattle into this country from America.

In reply, I am directed to state, for the information of Lord Salisbury, that their Lordships regret that it is not possible, in view of the provisions of the Contagious Diseases (Animals) Act, 1878, and of the existence of disease in America, to modify the provisions of the Order in Council of the 10th of February last relating to cattle brought from the United States.

I beg to return, herewith, Mr. Welsh's note as requested.

I am, &c.
(Signed) E. Harrison.

The Under Secretary of State,
&c. &c. &c.
Foreign Office.

No. 6.

LETTER from the BRITISH CONSUL-GENERAL at NEW YORK to the MARQUIS OF SALISBURY.

(No. 22, Consular.)

British Consulate General,
New York, March 8, 1879.

My Lord,

I have the honour to transmit, herewith enclosed, for such information as they may furnish, extracts from the New York Herald newspaper of the 6th and 8th instant containing letters from the correspondents of that paper at St. Louis and Chicago, in which it is stated that Texan cattle, detained at Chicago on their way eastward, became diseased with pleuro-pneumonia, owing, as it is represented, to unhealthy stabling and feeding at the last-mentioned city. Together with the copies of the letters in question, I enclose editorial notices which appear to maintain the correctness of the reports of the correspondents. Until, however, these statements shall have been confirmed by reports of official inspectors or veterinary surgeons, it would be unsafe to accept them as conclusive.

It will be seen on reference to the extract from the "Herald" of the 6th instant that certain cattle and sheep imported from Jersey, by the way of Southampton by the steamer "Lepanto" have been quarantined at this port in accordance with the recent Order of the Treasury Department, on the ground that they have been imported from an infected country.

I have, &c.
(Signed) E. M. ARCHIBALD.

The Most Noble
The Marquis of Salisbury, K.G.
&c. &c. &c.

Enclosures in No. 6.

"New York Herald," March 6, 1879.

Cattle Disease in the West.

An important contribution to the history of that part of the trade in live cattle which has resulted in excluding our dealers from British markets will be found in the letter we publish to-day from our correspondent at St. Louis. It has been a mystery to the general public how pleuro-pneumonia, which did not exist as an epidemic in the great cattle raising districts, and was unknown in the herds sent forward from their native plains for exportation, though it was known to exist in swill-feeding stables from which animals were not exported, yet appeared to such an extent in shipments of American cattle on their arrival at British ports, as to force the English government to make a rule against our cattle. The mystery is now cleared up by the discoveries of "Herald" correspondents in Western cities; and once more we have an illustration of the old truth that the ruin of trade is due to dishonest and unscrupulous traders. At Chicago from 8,000 to 12,000 cattle are fed every winter in stalls, to be sent eastward in the spring as fattened stall-fed cattle. How they are fed and how they are kept is a story the record of which is a vivid repetition of the descriptions that have been written of the Blissville stables. But the whole procedure is given in the St. Louis letter we print to-day. It appears that upon the arrival at the stock yards there of a large consignment of Texan cattle the animals in good condition are sold readily and shipped eastward for butchery here or exportation, and that they are sound and healthy. But in every consignment there will be poor specimens—not diseased, perhaps, but half starved, lean and feeble. These, of course, sell at a low rate and are bought by feeders, who put them into swill stables, fatten them up, and then by collusion put them into the sales of fresh cattle from the Plains. Doubtless in those swill stables pleuro-pneumonia exists permanently as in the swill stables here, and the animals remaining long enough to be contaminated are thus sent out as Texas cattle, yet with a disease caught in the swill stables.

"New York Herald," March 6th, 1879.

Diseased Cattle.—Professional Slop Feeders in the West.—Fattening Cattle for East.—Kept in Filthy Pens and Fed on Distillery Refuse.—The East St. Louis Supply.

St. Louis, March 2, 1879.

It has been known for some time that slop-fed and diseased cattle were shipped from this point to the Eastern markets and there disposed of as good conditioned Texas stock. This evil has been steadily growing until it has assumed so startling a magnitude that only prompt and strong measures will enable the authorities to put a stop to it. Your correspondent visited the stock yards at East St. Louis with the view of ascertaining, if possible, the extent of this evil, and the number of cattle that had been held over at this point to fatten for the Eastern market, but, owing to the shrewdness of buyers, the feeding of slops is not carried on in the yards, the owners having found from experience that it materially affects their sales; consequently a new class has sprung up, called professional feeders, who, to carry on their work more successfully and elude detection, ship the cattle off to out of the way places, re-ship them to the stock yards after putting them through the fattening process and send them East in mixed lots with through shipments, thus preventing even a fair estimate of the number of slop-fed stock that is in this way thrown on the Eastern markets. Beer slops and what is called "chop" feeding was carried on to a large extent right in the stock yards until owner's found that it damaged their sales.

How it is done.

As soon as a lot of Texan cattle are brought into the yards the best appearing and most saleable are quickly disposed of and shipped off within twenty-four or forty-eight hours, but the healthy cattle that the East receives in this way have a terrible offset in what follows. After the yard is pretty well cleared, then comes the professional feeder and buys up all the poor and diseased cattle and the odds and ends of unsaleable stock, getting great bargains, as the owners are glad to get them off their hands at any price.

Where it is done.

At an expense of much time and labor your correspondent at last ferreted out the location of these feeding quarters and discovered that the business is carried on to a large extent at Greenville, Worden, Vincennes, and even up as far as Peoria. Wishing to satisfy himself as to the condition of the cattle, and the extent to which it was carried on, he took an early train yesterday and visited the sheds of one A. H. McNeil, located at Greenville, Bond county, some 40 miles north of St. Louis. The condition and surroundings of the cattle there found was enough to breed disease, even if they were fed on wholesome hay and corn. In three long, narrow sheds there was an average of 150 head of cattle, crowded into narrow stalls, with no space to move about in, breathing the same air over and over again, as no means for ventilation were provided, and filth reigned supreme. Long troughs ran the full length of the sheds, and present almost as filthy an appearance as the floors and sides of the wall, slimy, steaming, and actually rotting; these troughs are filled twice a day with beer slops and chop feed, which the cattle learn after a time to devour ravenously, as no corn or hay is given them during the whole fattening process, which generally lasts from two to three months.

Fresh arrivals.

While your correspondent was looking through the sheds a small herd arrived that were easily recognized as Texas cattle. They were thin and poor, and appeared weak, either from starvation or disease, and unable to carry without tottering the weight of their enormous horns. They were separated and driven into a vacant shed, and each assigned a stall, after which the feeding process commenced. A quantity of beer slops and bran mixed was emptied into the common trough from barrels. Although they had not undoubtedly been fed for 48 hours, and, from insufficient food while in transit, preserved a half-starved appearance, they merely sniffed at the vile mixture and utterly refused to touch it, some of them lying down as soon as they were driven into the stalls, to be quickly prodded up with the long poles in the hands of the men who had them in charge. They are penned up in this way several days before they will touch food at all, but as soon as they do commence to feed on it it is surprising how rapidly they fatten up and the healthy appearance they present. They are kept in these close sheds where no pure air can reach them for two and three months, kept in a filthy and disease-breeding condition and fed on nothing but distillery refuse and beer slops, until they present a healthy and fat appearance, when they are re-shipped to East St. Louis, and there sold from the stock yards as fresh and healthy Texan cattle, mixed up with *bonâ fide* shipments from Texas and Colorado.

Undoubtedly diseased.

In this way there are daily shoved on the Eastern market from eight hundred to a thousand head of cattle that are undoubtedly diseased, so intermixed with good condition stock that it is impossible to separate them after they reach the East. This is very easy to do at this end, there being no veterinary surgeon at the yards, and no effort is made before shipping to separate and examine even what are known to be mixed lots, and, as a consequence, it is safe to say that all are more or less diseased by the time they reach New York.

This nefarious proceeding is not confined to up-country buyers, but is also practised by the original owners. They come here daily with a miserable looking lot of cattle with the intention of holding them over in the East St. Louis yards for the purpose of slop fattening, but when they find that buyers are becoming too sharp to be imposed on in this manner, they assign them to the out of town feeders, and make some amicable arrangement whereby it will be covered up when the cattle are returned to the yards that they have been still fed.

The daily Supply.

There are to-day in the stock yards about 800 head of stock that from all appearance are half starved, and in all probability would not outlive a journey to New York in their present condition, but in a day or so they will be bought up and shipped off to some unwholesome feeding pen, and in a couple of months will be returned in a fattened condition, but with disease in every pore from the close quarters, filthy surroundings, and utter lack of care while under treatment by this economical plan; the actual cost not exceeding $3 per head, and fully 300 pounds are added to their weight. There were shipped yesterday 970 head, a large percentage of which were undoubtedly re-handled here, and have been penned up for weeks and fed on distillery refuse. This thing is going on every day, but as a matter of course is kept very quiet, and all operations are so underhanded that it is impossible to get at reliable figures as to the actual shipments, or the number of re-handled cattle that are shipped in the midst of through lots.

More Cattle at Blissville to be killed.—English stock quarantined.

When General Patrick returned to the office of the Board of Health in Brooklyn yesterday, after his conference with the Custom House officials of this city in reference to the cattle supposed to be diseased on the steamer "Lepanto," he was waited upon by Dr. McLean, sanitary inspector, who presented his report in relation to infected stables and diseased cattle within the city limits of Brooklyn. According to some of these reports it appears that during the past two days three cows were led from the Blissville stables and killed at the slaughter-house of Moses May, on Johnson Avenue. During the same period 17 cows, found to be infected with pleuro-pneumonia at the stables, were knocked on the head and thrown on the offal boat for removal to Barren Island. Only 148 cows now remain at the Blissville stables, and before the lapse of many days, all, whether sick or healthy, will have been slaughtered. Dr. McLean spurns the idea that the stables will thereafter be set apart for steers only. He says it is much more likely that the place will be filled with hogs, which will secure ample consumption for the swill. General Patrick said that he had been unable from the pressure of business to devote as much attention to the examination and slaughter of the Blissville cattle as was expected in the beginning of his labours, otherwise not one of the animals would now be living. He sends couriers every day to the stables in order to be kept informed as to the manner in which the quarantine is maintained. This insures constant vigilance on the part of the sheriff and his deputies.

Dr. McLean is preparing a statement in relation to the prevalence of pleuro-pneumonia among the cows in the Blissville stables, and he will reply therein to the opinions expressed by the veterinary surgeons who contended that there was not a case worthy of serious attention. His challenge, published in the "Herald" some days ago, has not yet been accepted. Its acceptance, he says, must come through the columns of the "Herald," the medium through which it was issued. "The high standard," said he, "hitherto maintained in the veterinary profession demands that this question be subjected "to a decisive test. I cannot conceive how there can be any backing out where professional reputations are at stake." The result of the controversy is eagerly awaited in professional circles both in this State and New Jersey, and Dr. McLean speaks with a determination on the subject that shows he is thoroughly in earnest.

Professor Law was absent from the office of the Brooklyn Board of Health during the day pursuing his investigations into the interior of Queen's county. Roslyn was the first objective point, and Mineola will have its turn next. The Quarantine Commissioners have entered on a week of increased activity. The extension of their field of operations through several counties involves heavy labors and responsibilities. The office is visited daily by dozens of owners of cows asking for permits, so they may not fall into the meshes of the law. After the application has been made a thorough inspection of the stable and cattle by one of the sanitary inspectors must be held before a permit is granted, and quarantine regulations where such may be necessary, laid down. It is worthy of notice that since the extensive slaughter of Blissville cattle the depots of the Erie and Midland Railroads in Jersey City are nightly crowded with milk wagons from the eastern and middle sections of Brooklyn. The increased demand for milk from Orange, Rockland, and Sullivan counties in this State, and Bergen, Passaic, Sussex, and Morris counties in New Jersey, has caused a stir amongst the farmers in those sections.

Feeding with Swill.

Mr. Rouse, Chairman of the Legislative Committee on the Cattle Disease in New Jersey, contends that the swill is not injurious or unhealthy of itself. If it be given to the animals while fresh and when not too hot it does not produce any deleterious effects. In this opinion he is supported by promnent veterinary surgeons, one of whom observed that frequently swill is sent away a considerable distance from the city to farms and allowed to stand till it acidulates, when it becomes very injurious as food. If to this be added want of proper ventilation the cause of the cattle disease can be easily understood.

A resolution has been passed by the King's and Queen's Counties Dairymen's Association favoring the efforts of its members to stamp out pleuro-pneumonia among the cows of the two counties above named.

Cattle Dealers discharged.

Jacob Hecht and Abraham Stern, the two cattle dealers who were arrested on the 8th ult. charged with bringing diseased cattle within the city limits, thus violating a sanitary code, were arraigned in the Court of Special Sessions yesterday for trial. Dr. Comfort of the Board of Health, was put upon the stand, and stated that the cows were sickly and affected with a cough. They were consigned to A. Stern. The Veterinary Surgeon of the Board of Health testified that he examined the cows and found seven of them in the last stages of pleuro-pneumonia and the remaining four diseased. Mr. Judson, proprietor of the Gramercy Park Hotel, said that he sold a herd of 11 cows to A. Stern from his farm in Watertown, Conn., but whether they were the same cows referred to in the complaint he could not say as he had not seen them in six months. He disposed of the cows because he could not sell the milk, and they were a great expense to him. After the examination of several witnesses and a spirited discussion between the counsel, both the prisoners were discharged on the ground that the evidence given was insufficient to convict them.

English-blooded Stock quarantined.

The live stock on board of the steamer "Lepanto," from Hull, England, was landed yesterday morning, being confined for about 20 days. As stated in yesterday's "Herald," a telegram was sent to Secretary Sherman requesting his permission to quarantine the imported cattle on the steamship company's dock, at Jersey City, for one week, so as to determine whether any disease might develop itself.

Yesterday morning an answer came from the Treasury Department, granting authority to the Collector to give permission to land the stock, but to quarantine the same in some place where it would not come in contact with other cattle. Another conference was held, at which General Patrick was present, when it was decided to impound the 24 cows, 6 bulls, and 2 rams, for the space of two weeks in the stables No. 6, 8, and 10, Seventh Avenue. If in that time no signs of pleuro-pneumonia appear, permission will be given to take them to Pennsylvania.

"New York Herald," March 8th, 1879.

WESTERN CATTLE SHEDS.—A VISIT to the "STILL-FEEDING" YARDS of CHICAGO.—THOUSANDS of CATTLE FATTENING.—SCENES of FILTH and REPULSIVENESS.—THE "STRINGS."—NO DISEASE VISIBLE.—HISTORY of an ALLEGED CASE of PLEURO-PNEUMONIA.

Chicago, March 4, 1879.

THE feeding of beef cattle on distillery slops in Chicago and at other points in Illinois is an industry of no mean proportions. There are, in all probability, but comparatively few who appreciate the magnitude of this business, or who, when they sit down to a juicy roast or steak, pause to think how the animal from which it was taken may have acquired its fat tissues. "Still slop" to the average reader is associated with swill milk and numberless foul diseases and decaying tails and suppurating hoofs and other horrible conditions not cheerful to contemplate. This may be true in some localities where the feeding of milch cows has been carried on, no sanitary regulations enforced, and the animals permitted to roll in filth; but it must be conceded that in this section of the West at least, where fattening is conducted for the world's market, there is a different condition of things observable and vitally essential. There are from eight to 12 thousand head of beef cattle fed at the distilleries of Chicago every winter, and these form important integers in the live stock markets of the East and England, to which points they are shipped every spring. The business is carried on so quietly, as far as the general public not interested in the condition of the live-stock market is concerned, that it knows but comparatively little regarding the process of preparing their beef cattle for the block.

"Still-feeding" in Chicago.

The method employed in feeding the cattle which are detained at the various distilleries in and about Chicago is the same, in a general way, as that in vogue elsewhere; but it is extremely doubtful whether a better showing on the whole, as to the condition of the animals and of the varied details of care essential to carrying on the business can be presented in any other city of the Union where this industry is followed. To be sure, it is found here, as no doubt is also manifested by examination of feeding establishments elsewhere, that there are differing degrees of cleanliness and effective shelter in the surroundings of the beasts which have been selected for the long confinement and fattening process, but, taking all things into consideration, the Chicago still-fed cattle will, beyond question, average up a full maximum per centage of first-class condition. The "Herald" representative to whom was assigned the duty of penetrating to the heart of these foul and slimy resorts for cattle, where all is filth, no matter how assiduous may be the endeavours of the workmen to keep them clean; where unsavory steam arising from moist and manure-covered beasts and long and broad channels of turgid excrement, made "puddingy"—if the term may be used—by continuous streams of urine, fills the very limited space between floor and roof, and fairly nauseates the stomach on first inhaling it; where springy boards lying on pools of filth throw sprays of fetid accumulations on every passer by, and where wild and vicious steers and unruly bulls spitefully flirt their saturated tails into the face of the unsuspecting stranger who gazes for the first time upon a scene of this kind—the "Herald" representative, who has just passed through this ordeal, finds much that is of interest in the feeding-houses in Chicago. A cattle-feeding shed is by no means an inviting place in any sense of the word. It is a region of concentrated, pungent, and penetrating nastiness at best, an offence to delicate olfactories; yet, when we contemplate what it might be and what the Chicago sheds are, we must admit that the latter are, comparatively, as a tidy parlor to the habitation of a slovenly housekeeper, where uncleanness prevails and order is not known. A general description of the manner of feeding cattle here will cover the details of each separate establishment, for they are all conducted on the same general plan. It is unnecessary to enter here into any analysis of the characteristics of still slops, or to describe the method in vogue of producing the same. It is the refuse, as all must know, of the grain, yeast, and all such other ingredients as are employed in the manufacture of alcohol, high wines, or whiskey. When the mash has passed through the last stage of manufacture—that of distillation—it is, by means of large pumps, forced into flumes having a sharp grade, and by them run into vats located a short distance from the distillery buildings. These vats hold the slop which is intended for feeding to the cattle housed upon the premises. There are also other vats in the neighbourhood for the reception of slop sold to private individuals living in the neighbourhood and who use it as feed for their small bunches of cows and beef cattle.

The Feed Vats and Trough.

The number of cattle fed on the distillery premises is pretty accurately proportioned to the capacity of the distillery to supply slop per diem, so that there is but a comparatively small amount of slop which goes to outside parties by sale in wagon loads. The vats containing the slops for feeding to the cattle are so built that there is a swift and even flow given to the soft feed when it is sent on its journey to the animals in the sheds. The several vats are supplied with main flumes, which empty the slops into a general distributer usually run through the centre of the roof and furnished with lateral box pipes to shoot it into the feeding trough below at regular intervals throughout the various "strings," so called, of cattle waiting for their meal. In one or two establishments the supply was conducted to the feeding troughs by means of box conduits ranged along the outside of each row of sheds, and thence run into the feeding troughs from one end of the building only. The first-mentioned plan would seem to be preferable, as it supplies the feed more evenly and simultaneously along the entire feeding trough, and prevents cattle impeding its flow while others are impatiently awaiting their meal. The feeding troughs are about 14 inches wide and 6 inches deep, running from one side of the building to the other, and, when the slop is let in, are filled perhaps two-thirds full. At a distance of about 3 feet apart, and leading from the floor beneath the feeding trough to the roof, are placed stanchions, and to these the beasts are fastened by means of a short chain, a little more than a foot in length, caught into a large ring that encircles the stanchion and has free play up and down. This chain is fastened to another encircling the neck, and which is provided with a thick leather pad at the point where it rests upon the top of the neck so as to prevent chafing or soreness. As a general thing the cattle are fastened to the right, but in many instances it is found necessary to fasten them right and left on account of their vicious natures.

Jammed together.

So closely together are the cattle ranged that occasionally they interfere with one another, there being no partitions or stalls, and it is not infrequently the case that serious damage results from animals getting under the feet of their neighbours. Indeed, at several of the feeding establishments visited here instances of this kind were noticed. The buildings in which the cattle are contained are, as a rule, so constructed as to width as to permit of the ranging of about 40 head in each "string" or row. They are nothing more than sheds, and, as a general thing, are so flimsily constructed that their interiors are about as much exposed to the weather as are the outer portions. In only two of the establishments visited here were the roofs perfect or the sides of the sheds so securely battened as to "expel the wintry flaw." The shed might be likened as to form to a row of salt vat covert or inverted letters V moved close together and boarded up at either end, as for instance ΛΛΛ. In most of the establishments the lower edges of the roofs, which are supposed to be joined, are six inches to a foot apart. These spaces are closed up by pitching in hay, and the result is that in the majority of instances there are immense gaps through which the frosty air and pelting snow drifts in upon the haunches of the animals. Two of the feeding-houses of Chicago are admirably constructed, the space from the ground to the apex of the roof being nearly double the customary height, the buildings weather proof, and glass ventilators provided in the centre for the double purpose of fresh air and light. When it is borne in mind that the cattle, from being long housed, having no exercise for fully six months, and constantly surrounded by the steam from the hot feed, grow extremely tender of flesh and sensitive to the slightest alterations of temperature, as much so as would a human being kept continually in a warm room and deprived of exercise, the necessity of protecting them from sudden drafts of chilled air or other exposure liable to induce colds or have a tendency to check the development of fat tissues will be seen. The cattle are located in these sheds so that their haunches reach that point where the lower edges of the roofs meet, and the space in each compartment is large enough to admit two "strings" standing with buttocks towards each other, and with a space of perhaps three feet intervening. In this intermediate space the floor is sunk about one foot below the floor on which the animals stand, and serves as a conduit for excrement and urine, which, falling upon the main floor, is carried to the rear by its own gravity mainly, the floor quietly sloping, and finds its way to the common receptacle. The sheds are cleansed three times daily. This is done partly by flushing with warm water, this process being facilitated by the employment of rubber scrapers, the attendants passing between the animals and drawing the manure back into the channel between the "strings." It is then forced to the exterior of the building by means of a board, to which is attached a long handle, and the interior of the shed is thus for the time being, left comparatively free from filth. This same process is repeated from the outside, the manure having found its way from each feeding section along the row of sheds into a flume extending the entire length, and is finally elevated by means of a steam pump into immense reservoirs, from whence it is finally emptied through flumes into conveyances, boats or others, and eventually finds its way into the lake before this city.

Hay Feed.

The cattle in these sheds can never be hungry, for they are fed almost continually and given all they want at each meal. At 6 o'clock a.m. they are given slops, and also at 10 a.m. and 3 and 6 p.m. Twice daily they are fed hay, and at these meals they are furnished with salt. There is no time in the day that they do not have feed before them, and if they do not fatten upon the rations provided it cannot be attributed to any lack of attention in this direction on the part of the attendants.

Beastly Disgust.

As is, perhaps, perfectly natural, all the animals brought in do not take kindly to the soft feed, and utterly refuse to partake of the steaming mess. But in case they are not indisposed by reason of sickness they eventually decide to partake of the new article of diet, and finally appear to relish it as though it was the most natural article of food in the world. They can get no other.

"*No Sickness.*"

The cattle feeders, distillers, employés about the feeding sheds, and others entirely disinterested in the business, when questioned as to the prevalence of any sickness among the beasts, were unanimous and positive in their statements that nothing of the kind ever existed. To be sure it was true that now and then, when the animals were brought in, there might be one or two, or mayhap half a dozen, in a drove of one thousand or fifteen hundred, which would exhibit some signs of indisposition, but they would be nothing serious. Perhaps an animal would be worn out with travel and would refuse to eat. Out he must come and go to the stock yards, to be sold and killed for city consumption. Perhaps an animal, unused to the new feed, would get his feet into the hot mess and they became tender. Out he came also, for it would be useless to keep him in the herd, where he could not stand, and liable to be tramped on by his neighbours. Whenever anything of this kind was discovered, and it always occurs when the animals are first housed, the feeble ones are immediately taken from the remainder of the herd, and disposed of to slaughterers.

Fat and Healthy-looking.

The testimony of all was that there was no complaint among the cattle and never had been. This statement is most assuredly borne out by the present condition of the cattle in the Chicago feeding sheds. There could scarcely be a finer lot of animals gathered together, if their outward appearance is to be taken as a criterion of their inner condition. They are all clear-eyed, plump, active, and full of that spirit of general buoyancy that can only come of good health. In a tour covering the past three days, and in which time all the distilleries in Chicago were visited, at least such as engage in cattle feeding, and often looking over about seven thousand head of steers and bulls, the "Herald" representative did not find in a single instance an animal that gave the slightest symptoms of ill-health or debility. All alike were in prime condition, and gave every evidence of perfect health. One seldom looks upon more attractive beef animals—buttocks full, level on top and rounding beautifully in their downward curves; sides fat and heavy; shoulders strong; necks lying in folds; nostrils free of all diseased exudations; eyes sharp and dry and unsunken. Add to these evidences of good condition appetites unimpaired, and one cannot but concede that the still-fed beasts in the Chicago distillery sheds are as prime in every essential as it is possible for such animals to be. It may be said that the persons feeding these cattle—the distillery proprietors and the owners of the cattle—are, of course, interested in setting forth the condition of the animals in the best possible light, and this, of course, may be so; but when one takes the trouble to look at the animals individually, passing through every alley in each of the feeding sheds, as the "Herald" representative did, and thus has before him every opportunity to discover any evidence of disease, and finds that they are just as represented, he must state the facts as they exist, and add his testimony in favor of their general healthfulness.

Few Texan Cattle.

There are comparatively few Texans fed at the Chicago distilleries. Examination shows that the great proportion of animals are natives, varied by occasional bunches of Coloradans and Cherokees. These Colorado steers are graded as Texans, and are considered by feeders as of a superior quality in that their frames, being large, will take on proportionately more fat during the feeding season, and are therefore more profitable.

The "Still-feed" Season.

The feeding season in Chicago begins about the 1st of October. From that time until about the middle of May the cattle are kept on the slops. If the market warrants their being taken out any time between the latter part of March and the 15th of May they may be disposed of, but as a general thing they remain until about the last date indicated. The price paid for feeding, provided the cattle are owned by outside parties, is 9 cents a head per day. This amount is paid to the distillers for the slops and shed-room. The cattle owners furnish men to look after the animals and feed them, and also supply their own hay. In several instances in this city the distillers are the owners of the beef cattle. Generally where the distillers feed their own cattle they also feed milch cows for other parties on contract.

The Chicago Establishments.

There are in Chicago five large distilleries where cattle are fed on slops. These are the West Side Alcohol Works, the Phœnix Distillery, No. 2; Shufeldt's Distillery, the Garden City Distillery, and the Riverdale or Black Hawk Distillery. The West Side Alcohol Works are located at the intersection of Kinzie Street and Western Avenue. This Company are feeding about 400. The animals were driven in about the 1st of October, and are now in prime condition. They are mostly native steers. The animals are fed four times daily on slops and hay twice, and are as clean as cattle can be when surrounded, as these are, by natural filth. In the opinion of the feeders the animals will take on from 300 to 400 pounds during the term of confinement. The feeding sheds cannot be considered first class. The rule here is to cut out promptly any animal that may exhibit any signs of weakness or disease, and send it to the slaughter-house. But no disease of any serious nature has manifested itself. No Spanish fever has ever been discovered.

The Phœnix Distillery, superintended by Mr. George T. Burroughs, is located beyond the northern limits of the city, on a branch of the Chicago river. Here about 1,800 cattle are fed. All are in prime condition. The gain in weight is estimated at about 400 pounds. The cattle are owned by the distilling company. About 300 are Texans, the remainder Cherokees, Coloradans, and natives. The sanitary regulations are excellent. Care is taken to cut out all cattle that may develope disease; but thus far the sheds have been free of all complaints. There have been no fevers and no symptoms of lung affections. The feeding-houses are kept pretty clean; yet it must be stated that they are not in as good condition—or were not on the occasion of the visit of the "Herald" representative—as the necessities of the case would demand. The buildings are poor, and the cattle in many cases subjected to continuous draughts of cold air, which are liable to engender lung difficulties. The animals will probably be shipped early in May. They are intended for domestic and foreign markets. They will be shipped first to the Albany (N.Y.) yards. Feeding here is conducted on the same plan as described elsewhere in this letter.

The Garden City Distillery is located in the southern portion of the city, on West Twenty-second Street, near Halstead Street. It is a large establishment, and has accommodations for fully 1,200 cattle. At present there are 1,000 feeding, mostly natives, with some Coloradans and Cherokees—few thorough Texans. There has been and is no sickness in the entire lot. The regulations require that any diseased cattle shall be promptly taken from the sheds and sent off the premises. Even if the cattle do not take to the slops and persist in not eating they are cut out. Mr. Powell, of the Garden City Company, estimates that the cattle will take on about 250 pounds each during the feeding season. The present lot came into the sheds about the latter part of November, and will probably remain until the 15th of May. They will be shipped to Albany, and many of them will, no doubt, find a market abroad. These cattle are owned by a Milwaukee party who has made a specialty of fattening beef for the English trade. The feeding-sheds here are in fair condition, and were found to be in a commendable state of cleanliness.

The Shuteldt Distillery is on the north side of the city, near Chicago Avenue, on Larrabee Street. There are about 1,600 head feeding. The sheds are spacious, well-ventilated, and warm. The floors are kept remarkably clean, and the animals are in excellent condition. The same system of feeding is followed as in the other establishments, and the sanitary regulations are extremely rigorous. No disease has been discovered. The animals are healthy and vigorous.

The Riverdale, or Black Hawk, Distillery is about 20 miles from Chicago on the Illinois Central Railroad, at a point known as Dalton. Here there are about 1,500 head of cattle feeding. There is no sickness among them, and the condition of the sheds is good in every respect. The regulations regarding sick animals are stringent, and the cattle are kept as clean as is possible. The testimony as to gain in flesh and other points concerning feeding and care is the same as was elicited at the other establishments.

Outside Stables.

Additional to the foregoing may be mentioned the feeding of cattle now being carried on at several other points in the State—namely, Springfield, Pekin, Peoria, and Sterling. From all reports received from those localities the animals are in excellent condition.

A Summary.

The slop-fed cattle in Illinois may be briefly summarised as follows :—

Chicago.	No. of Head.	Texans.
Alcohol Wells	400	—
Phœnix Distillery	1,800	300
Shufeldt's	1,600	50
Garden City Distillery	1,200	100
Riverdale	1,500	—
Pekin	2,000	—
Sterling	2,000	—
Springfield	2,000	—
Peoria	3,500	—
Scattering at Pekin and Peoria	2,000	—
Totals	18,000	450

Pleuro-Pneumonia.

In connexion with the foregoing it may be apropos to mention here a few facts in relation to the excitement that has prevailed the past week at the Union Stock Yards, Chicago, and among live stock dealers generally in the West regarding the reports which have gone out as to the discovery of a case of pleuro-pneumonia. It is very unfortunate that such a rumor should have gained credence even for a moment, for the injury it is calculated to do is very great. The whole thing was more the result of hasty judgment and nervous excitement on the part of those to whom has been intrusted the inspection of live stock at this point, than any desire to strike a blow at the cattle interests of the West, for it must be conceded that the gentlemen in whose hands this matter rests are commendably jealous of the good of this section of the country. That the report has gone abroad that a case of contagious pleuro-pneumonia was discovered here there can be no doubt, and it is due to the Western live stock interests that it should be corrected. It appears that on the 22nd of February a heifer was found at the stock yards which, as the government inspector reports, "exhibiting signs of pleuro-pneumonia." The animal was as once killed, and steps taken to examine it. Before this was done the inspector unwisely, and when labouring under great mental excitement, sought out the collector of this port and informed him that a veritable case of pleuro-pneumonia had been discovered, and assistance of experts was asked in order to make a thorough examination. At the same time an assistant of the government inspector informed the editor of the "National Live Stock Journal," in this city, that they had found a case of contagious pleuro-pneumonia. Coming from a source deemed authoritative this statement was repeated, and the announcement at once went out that the dreaded cattle disease had in fact made its appearance at the West. This was prior to the careful investigation of the lungs and pleura of the slaughtered heifer. A day or two later, when the authorities had looked into the matter with greater care, the diseased parts of the animal were found to not show any enlargement, mottled condition, or disease of the pleura. In contagious pleuro-pneumonia these conditions are always present. The hepatization of the lungs showed only that the beast had been afflicted with a sequel of some lung disease, probably common pneumonia, which is not in the slighest degree dangerous or contagious. These statements as to the condition of this animal are made by accomplished veterinarians and must be accepted as true. Meantime, however, the other report had gone out, and it will probably be some time before the effect of the false announcement can be neutralised. The government inspector has, of course, striven to shake off from himself all responsibility for the first rumor, but it would appear that his excited condition and haste to make known the fact that an animal had been found with pneumonia symptoms had the effect to falsify the true condition of things. It was nothing more than common or sporadic pleuro-pneumonia not contagious.

IMPORTATION OF CATTLE.—ASSISTANT SECRETARY FRENCH on the QUESTION of PROHIBITING the LANDING of CATTLE imported from GREAT BRITAIN.—PLEURO-PNEUMONIA and its existence in ENGLAND considered.—Continuance of the PROHIBITION advised.

Washington, March 7, 1879.

The following report from Mr. H. F. French, Assistant Secretary of the Treasury, upon the subject of the recent Treasury orders prohibiting the landing of cattle from England, was read at the Cabinet Council to-day, and upon consideration of the facts stated the Treasury order of February 26, 1879, will remain in force:—

To the Secretary:—

The question presented is whether the order of this Department of February 26, 1879, prohibiting the landing of cattle imported from Great Britain until otherwise ordered should be rescinded or modified. Said order was issued upon information that the disease known as pleuro-pneumonia, which in England is often called the cattle-plague, had appeared in Hull and other parts of England. Hull is a port on the north-eastern coast of England between which and New York a regular line of steamers plies, touching at Southampton, where cattle from the Channel Islands are taken on board and brought to the United States.

Origin of the Disease.

The pleuro-pneumonia, as it was familiarly known in Massachusetts nearly 20 years ago, was introduced from Holland by the importation of Holstein cattle by Mr. Cheney, of Belmont. I assisted in the investigation of the disease at that time, and I judge from the facts recently made known that the disease now prevalent to some extent in this country and Great Britain is of the same type. It is a contagious disease, and is supposed to be communicated not only by actual contact of sound cattle with those diseased, but through infected fodder, or bedding, or buildings. A marked feature of the disease is that it often incubates or lies dormant from 30 to 50 days, and even more, after its seeds are sown, and during this period of incubation, whether longer or shorter, not even a skilled veterinary surgeon can detect its presence. Cattle may therefore be purchased in England, shipped to this country, sold at auction and dispersed over our principal stock-breeding States without the possibility of detecting the disease by any inspection of the animals.

Measures of Prevention.

The States no doubt have full power by quarantine or other regulations to protect themselves against the spread of this disease; some of them, as Massachusetts and New York, have adopted measures for this purpose. The necessary measures for the inspection of this disease, as adopted in those States and in England, are:—The isolation of all suspected herds and the slaughter and burial of all animals found to be infected, and usually of all that have been exposed to the infection. These measures, with provision for proper compensation to the owners of the cattle thus slaughtered, are now enforced in England and in the States already named, and probably in many others. Several States into which cattle are imported, it is understood, have no such regulations. Of these I understand Maryland to be one, and Baltimore is a port both of importation and exportation of live cattle.

If Congress possesses the power to prevent the introduction of the cattle disease by enforcing the inspection and quarantine or the destruction of suspected animals, it has thus far failed to exercise such power. The only provision on this subject to be found in the laws of the United States is contained in sections 2,493, 2,494, and 2,495 of the Revised Statutes.

Section 2,493 Revised Statutes provides that:—

The importation of neat cattle and the hides of neat cattle from any foreign country into the United States is prohibited, provided that the operation of this section shall be suspended as to any foreign country or countries, or any parts of such country or countries whenever the Secretary of the Treasury shall officially determine, and give public notice thereof, that such importation will not tend to the introduction or spread of contagious or infectious diseases among the cattle of the United States; and the Secretary of the Treasury is hereby authorised and empowered, and it shall be his duty to make all necessary orders and regulations to carry this law into effect, &c.

By section 2,494 of the Revised Statutes, the President has the power to suspend the operation of the above section whenever, in his judgment, the importation of neat cattle and their hides may be made without danger of introduction and spread of the contagious diseases, &c.

I think it is clear that section 2,493 of the Revised Statutes confers upon the Secretary of the Treasury no authority whatever to quarantine or isolate, or to slaughter imported cattle. The only power conferred upon him is to suspend the operation of the section whenever he shall officially determine "that such importation will not tend to the introduction or spread of contagious or infectious diseases," and to make the necessary orders and regulations to carry this law (*i.e.*, the law to prevent the importation of neat cattle, &c.) into effect, and to suspend the same as provided. The only power that the President has under section 2,494 of the Revised Statutes is to suspend the prohibitory law whenever in his judgment the importation may proceed without danger of the introduction of disease. The only question, therefore, to be considered at present is whether the Secretary of the Treasury or the President can determine that the statute prohibiting the importation of neat cattle, &c., can be suspended without danger of the introduction of the cattle disease.

The Disease in England.

By a letter from J. D. Harrison, Secretary of the New York Agricultural Society, dated February 12, 1879, addressed to the Secretary of the Treasury, attention was called to the fact that cattle of the Jersey island are at this time brought to the United States frequently, and in considerable numbers, by steamers sailing from the port of Hull, and at least one shipment was about to arrive, and the Secretary was urged to take proper precautions against the importation of diseased or infected cattle. Mr. Harrison is a worthy representative of one of the oldest and most efficient agricultural societies in this country and a society specially interested in the importation and improvement of neat cattle. At about the same time statements had been officially made in the papers and otherwise tending to show that pleuro-pneumonia had broken out at various places in England. We had information also that the steamer "Lepanto" was about to arrive in New York from England, bring a herd of Jersey cattle from Southampton to be sold at auction in New York. In the meantime, as will presently be more fully shown, the pleuro-pneumonia had appeared in various parts of the United States, especially near New York city. The Dominion of Canada, on February 6, 1879, had published an Order of Council prohibiting the importation or introduction into the dominion of cattle from the United States for a period of three months from that date. We had learned also that two herds of cattle, one being from the United States and one from Canada, shipped from Portland, Me., by the "Ontario," had been found to be deceased with pleuro-pneumonia on their arrival, and a part or all of them condemned to be slaughtered.

Prohibitory Order issued.

No other power to deal with the disease existing by law the order of February 26, prohibiting importation from England, was issued. This order has given the department power to co-operate with the authorities of the State of New York in preventing the sale and dispersion through the country of the cattle imported by the steamer "Lepanto," which arrived at New York about March 1st. The importers readily complied with the conditions, satisfactorily to the collector of customs at New York, and to the authorities of the State of New York, and the herd, consisting of about 40 animals, is now quarantined in New York for 60 days.

A letter from Mr. Packard our Consul at Liverpool, to Hon. F. W. Seward, Assistant Secretary of State, dated February 10th, 1879 states that the London "Times" of of February 7th, published a report that pleuro-pneumonia had broken out among the cows of William Robinson, a dairyman at the north end of Liverpool. Upon inquiry of Mr. Robinson it appears that on November 27th, January 3rd, and February 4th, he had sold a cow to a butcher, and these three cows had all been found to be diseased, and that on February 7th all of his remaining cows, six in number, were slaughtered by order of the Privy Council. He says all the animals were English, and that he never brought an American cow or saw one offered for sale. Upon inquiry Superintendent Walsh, of the Bootle police, said the pleuro-pneumonia had appeared about six months ago at the dairy of Mr. Wilson, near Crosby, who kept 21 cows. Six were found diseased and all were slaughteted. On the farm of Mrs. Haines, near Bootle, about the same time, three cows had the disease and were slaughtered and buried. Pleuro-pneumonia appeared on October 28th at the dairy of Rowland Allen, near Liverpool, and of 15 cows 11 were diseased, and all were slaughtered. On October 17th, at the dairy of Mr. Lambert, one cow was attacked and 11 were slaughtered. None of these cows were American.

The article referred to, from the London "Times," is annexed to Consul Packer's letter. From this it appears that of 197 cattle landed at Liverpool by the "Ontario," from Portland, all have been slaughtered and 13 of the number only found infected.

A second letter from Mr. Harrison, secretary of the New York Agricultural Society, dated January 26, 1879, fully sets forth the danger of the trade in cattle between Hull and New York, and urges the department to take measures to prevent the introduction of the pleuro-pneumonia through that channel. He says:—

The port of Hull is, at latest mail advices, infected with lung-plague, contagious pleuro-pneumonia, of cattle. This port having a constant trade with Holland—the very home, during the present century, of lung-plague—has for a long time been one of the most dangerous of all ports as regards the receiving and disseminating of this worst of all diseases of cattle.

A letter from Dr. James Low, of the Brooklyn Board of Health, addressed to General Curtis, dated February 28th, 1879, strongly urges one of two courses—either the absolute prohibition of the importation of cattle from Europe, or the placing of newly arrived animals in quarantine for at least two months, and then an examination weekly by a veterinary expert and the burning or disinfecting of all the bedding, fodder, and other moveable objects connected with animals imported from foreign countries.

Under this state of facts the Secretary will consider whether it is safe to suspend the order of February 26th, preventing the importation, in view of the fact that this order is the only means provided by law by which any officer of the Government is authorised to interfere in any way with the importation of cattle.

Export of Live Animals.

From the Bureau of Statistics we learn that the exports of live animals have increased from $733,395 in 1868 to $5,844,653 in 1878, being an increase of about eightfold: that the exports of horned cattle during the first five months of the current fiscal year amounted to $4,414,000—$517,182 in excess of the value of the same during the entire preceding year. Of the cattle exported in 1878, about 62 per cent. went to Great Britain. The following table exhibits the number and value of the cattle entered for consumption from 1873 to 1878:—

STATEMENT showing NUMBER and VALUE of CATTLE ENTERED for CONSUMPTION from 1873 to 1878.

	Number of Cattle.	Value. Dolls.	Cts.
Year ending June 30, 1873 - -	34,998	826,764	51
„ „ 1874 - -	45,715	884,961	29
„ „ 1875 - -	45,310	748,151	71
„ „ 1876 - -	30,068	458,264	82
„ „ 1877 - -	31,893	314,094	37
„ „ 1878 - -	41,933	475,526	42
Totals - - -	229,917	$3,707,763	12

H. B. JAMES,
Chief of Customs Division.

Customs Division, March 6, 1879.

Purposes of Importation and Exportation.

In considering this subject it is necessary to bear in mind the different purposes for which cattle are exported and imported. Our exportation of neat cattle to England is chiefly for immediate slaughter for beef, although some cattle, no doubt, are sold to be sent into the country to be fattened, and some, perhaps for dairy use. The great bulk of our cattle received at English ports are intended for immediate slaughter. Where abattoirs are provided, as is already done at several of the ports, an Order of the Council that the cattle shall be immediately slaughtered on arrival brings no great loss upon the owner, while it effectually prevents the spread of any disease from that source through the kingdom. On the other hand, the cattle imported from Great Britain are almost entirely of valuable breeds of short horn or Channel Island cattle, intended for breeding purposes and not slaughter, and, being purchased of breeders in all parts of the country, are liable to carry contagion over our whole land. An order to slaughter them upon arrival would be equivalent to an order of non-importation. While we may properly suspend the importation of cattle from England until the danger of contagion has passed, England has no similar reason for prohibiting importation into that Kingdom, but may wisely and properly maintain stringent regulations for inspection, and require slaughter of the animals at the ports of arrival as a precautionary measure.

The Disease in the United States.

I am not yet satisfied as to the extent of the prevalence of the cattle disease in the United States. We are taking measures to gain information daily upon the subject One thing, however, we may regard as certain, that England has reason to believe that the pleuro-pneumonia prevails to a considerable extent in this country. A letter from the Minister of Agriculture of Canada, dated February 24th, 1879, addressed to Mr. Le Duc, Commissioner of Agriculture, states that the cattle taken to England by the "Ontario" were purchased in Ohio and other parts of the West, and were taken immediately from cattle yards in Buffalo, and that "the imperial authorities have in-" dubitably satisfied themselves that the disease conveyed by the cattle of the "Ontario" " was pleuro-pneumonia of the most malignant type."

Further, that Professor McEachran, of Montreal, who was specially commissioned by this department, did find pleuro-pneumonia in the State of New York, in the district of Columbia, in Virginia, in New Jersey, and other places.

I should be glad to have it demonstrated that the disease does not exist in the Western States, or in Maine, Vermont, or New Hampshire in the Eastern.

I do not place full confidence in the above statement of the Canadian Minister, but it will undoubtedly be accepted in England as true. The exportation of neat cattle from this country has already almost entirely ceased. In reply to telegrams addressed to the ports of Portland, Boston, New York, and Baltimore I received answers yesterday that no exportations were contemplated at either port, so far as known, except a shipment contemplated on the 10th instant, per "Sumatra," for London. The only course by which the exportations can be resumed is the adoption on our part of energetic measures to stamp out the disease wherever it may appear.

I think the order adopted by this department prohibiting importations for the present will be everywhere regarded as a step in the right direction, and cannot be regarded by England as unfriendly to our commerce with that nation.

I send herewith a memorandum by H. B. James, of the Customs Division, showing various orders and restrictions heretofore placed upon the importation of live animals.

Very respectfully,
H. F. French,
Assistant Secretary.

American Cattle for Foreign Markets.

The first examination of cattle for shipment abroad since the 14th of February last was made at the yards at Sixtieth Street yesterday afternoon, and the animals will be shipped this morning. A "Herald" reporter learned upon inquiry at the office of the Collector of the Port that it is General Meritt's intention to appoint a special officer for the inspection of cattle intended for transportation abroad, but so far no authority for such appointment has been received from the Treasury Department. At present the inspections are made under the directions of the Surveyor's office. General Graham, the Surveyor of the Port, said to the reporter that the examinations were made by a veterinary surgeon under the supervision of a Custom House inspector, and he added that the inspector's who are chosen for this duty are those most familiar with disease in cattle. For further information he referred the reporter to the barge office, where Colonel Kibbe was found. Colonel Kibbe stated that the veterinary surgeon is employed by and at the expense of the exporter, but that the inspector must be satisfied of his character and capacity. The examinations are very thorough. Every animal is examined as thoroughly as if it was a question of bargain and sale, and as most of the inspectors detailed for this duty are butchers, and so in a manner experts in regard to diseases in cattle, there is little or no danger of infected animals being shipped. The eyes and nostrils are especially scrutinised. Applications for permits to ship cattle are made at the surveyor's office, and the permits are not granted until a thorough examination in every case demonstrates that the animal is free from disease.

General Patrick preparing to change his Base of Operations.—Jersey City receiving Attention.

While the sanitary squad in Brooklyn was busied yesterday in the examination of stables in the Northern and Eastern districts, General Patrick was occupied in his headquarters at the office of the Board of Health in receiving reports from several quarters in Queen's County. Among those who called were gentlemen interested in cattle traffic from Glen Cove, Mineola, Roslyn, and Jamaica, desiring to obtain more definite information in regard to the removal of cattle to New York. In every instance General Patrick informed the applicants that no cattle could be removed without a permit from the State authorities, assuring the owners at the same time that they would be subjected to as little inconvenience as possible. He stated explicitly that the officers appointed by the Quarantine Commissioners would proceed with the utmost expedition if their efforts were seconded by the proprietors of stables. To use the general's words, " I wish heartily that this business were ended in this section of the State, so that we " might turn our attention to other quarters. This matter is so important that we " cannot afford to spend too much time in one place." The general declined to state what new instructions he received from the Executive, but the movements in his office yesterday indicated that he is about to direct his efforts in other directions. The quarantine staff refused to impart any information on the subject, but an officer of the Brooklyn Board of Health told a "Herald" reporter that as soon as the cattle at the Blissville stables could be disposed of, the services of Sheriff Rushmore would be required in another portion of Queen's County. The sheriff seemed to have anticipated the order as several of his deputies were notified that their services at Blissville would be dispensed with at the end of next week. General Patrick will remain, however, at his present headquarters in Brooklyn, and direct the quarantine operations in the counties to which his jurisdiction is extended. Continual complaints arrive from Staten Island, Westchester, Suffolk, Rockland, and Orange Counties, but the work is of such magnitude that it will be necessarily slow. The general frankly stated that when the quarantine at Blissville was established he did not anticipate the immense work to be encountered by the quarantine staff. He has made a proposition to the proprietors of the stables at Blissville in regard to the establishment of a large cattle yard in that vicinity, after the cattle now in the stables have been slaughtered, and the subject will be fully discussed on Monday evening. It has been definitely settled that the new quarantine yard shall not be located within the municipal limits of Brooklyn.

Instructions have been issued that the cattle boat "Midland" shall land all the animals brought from the Jersey shore hereafter at the foot of Broadway in Brooklyn. The New Jersey Stock Yard Company has been notified that if the boat from their yards at the Long Dock transgress the rule laid down in regard to the landing at Broadway the officers of the boat will be arrested, and the boat seized by the State authorities. Although this may be regarded as an extreme measure, it has been recommended by the wholesale butchers and cattle dealers of Williamsburg, who refuse to allow the cattle consigned to them to mingle with those coming from the Long Dock.

The New Jersey Raid.

The members of the examining committee of the Jersey City Board of Health, comprising Health Inspector Cronin, and Drs. Lochner and Knauper, and Professor Chambon, continued their investigations in regard to the condition of the stables in the Greenville section of Jersey City yesterday. They found many stables in a filthy condition, and several cattle were suffering from pleuro-pneumonia. Professor Chambon and Inspector Cronin have been selected by the Legislative Committee on the Cattle Disease as examiners of stables in Hudson County, pending the passage of the Cattle Diseases Bill in the lower house.

SWILL-FED CATTLE FROM THE WEST.

Another contribution to the history of the progress of Western cattle from the plains to the seacoast is given in the letter from Chicago which we print to-day. It will be noted that it repeats with some ampler details the story given in the letter on the same subject from St. Louis which we printed on Thursday. In the account given of some particular features of the cattle trade in these two great cities, the public interested in knowing the truth on this subject—and an exact knowledge of the truth is the first step toward the discovery of a remedy—will see clearly established that connexion between swill stables where pleuro-pneumonia certainly exists, and the great cattle-breeding plains where the animals are certainly healthy. Our veterinary surgeons and our cattle breeders and sellers have denied the existence of this malady in marketable cattle as strenuously as the English officers have declared its existence, and these denials were made precisely because our surgeons and dealers were unable to comprehend that there could be any possible connexion between the healthy cattle from the plains and the cattle stewed for months on a fattening process in the foul hot air of a swill-feeding pen. How puny specimens of the healthy cattle are sold cheaply on the way, fattened in these pens, and sold again as healthy cattle from the plains we have now shown, and we leave it to those most interested to find a remedy.

No. 7.

LETTER from FOREIGN OFFICE to the CLERK OF THE COUNCIL.

Sir,
Foreign Office, March 26, 1879.

I am directed by the Marquis of Salisbury to transmit to you the accompanying copy of a note from the United States Minister at this Court, stating that landing of cattle from England has been prohibited in ports of the United States owing to the alleged existence of pleuro-pneumonia in the vicinity of Hull, and requesting investigation as to the existence of the disease, and I am to request that in laying this latter before the Lords of Her Majesty's Privy Council, you will move their Lordships to cause Lord Salisbury to be informed what answer should be returned to Mr. Welsh's note.

I am, &c.
(Signed) JULIAN PAUNCEFOTE.

The Clerk of the Council,
&c. &c. &c.
Veterinary Department.

Enclosure in No. 7.

Letter from the United States Minister, London, to the Marquis of Salisbury.

My Lord,
Legation of the United States, London, March 19, 1879.

I have the honour to acquaint you that the Secretary of the Treasury of the United States, having received authentic information that the disease known as pleuro-pneumonia has recently been found to exist among cattle in the vicinity of Hull in this kingdom, he has, under the provisions of section 2,493 of the United States Revised Statutes instructed the collectors of customs at the principal ports not to permit the landing of neat cattle from England until otherwise ordered.

I have been requested by Mr. Evarts to inform your Lordship of this temporary prohibition.

Meanwhile, the Secretary of the Treasury desires that investigation should be made through the Diplomatic and Consular Officers of the United States in England, in regard to the extent to which the disease exists here, and such other facts upon the subject as may be useful to his department in deciding what course hereafter to pursue.

I beg leave, therefore, to ask your Lordship to assist me in obtaining this information either from Her Majesty's Privy Council, or such other branch of the Government as may have official cognizance of this matter.

I have, &c.
(Signed) John Welsh.

The Marquis of Salisbury,
&c. &c. &c.

No. 8.

LETTER from CLERK OF THE COUNCIL to THE UNDER SECRETARY OF STATE, FOREIGN OFFICE.

Veterinary Department, Privy Council Office,
Princes Street, Westminster, S.W., April 1, 1879.

Sir,

I beg to acknowledge the receipt of your letter of the 26th ultimo, transmitting copy of a note from the United States Minister at this Court, stating that landing of cattle from England has been prohibited in parts of the United States owing to the alleged existence of pleuro-pneumonia in the vicinity of Hull, and requesting investigation as to the existence of the disease.

I am directed by the Secretary of State in reply to transmit, for the information of Lord Salisbury, a memorandum showing the counties in Great Britain in which pleuro-pneumonia has been reported to exist during the first twelve weeks of 1879.

I am, &c.
(Signed) C. L. PEEL.

The Under Secretary of State,
&c. &c. &c.
Foreign Office.

Enclosure in No. 8.

MEMORANDUM.

Pleuro-Pneumonia has been reported to exist in the following 51 counties of Great Britain, during the first 12 weeks of 1879.

Berks.
Cambridge.
Chester.
Cumberland.
Derby.
Durham.
Essex.
Herts.
Huntingdon.
Kent.
Lancaster.
Leicester.
Lincoln (Holland).
Lincoln (Kesteven).
Lincoln (Lindsey).
Middlesex.
Norfolk.
Northampton.
Northumberland.
Notts.
Rutland.
Stafford.
Suffolk.
Surrey.
Sussex.
Warwick.
Worcester.
York, East Riding.
York, North Riding.
York, West Riding.
Isle of Ely.
The Metropolis.
Carnarvon.
Flint.
Merioneth.
Aberdeen.
Banff.
Berwick.
Clackmannan.
Edinburgh.
Fife.
Forfar.
Kincardine.
Kinross.
Lanark.
Linlithgow.
Peebles.
Perth.
Renfrew.
Stirling.
Wigtown.

316 fresh outbreaks have been reported, and 942 cattle have been attacked, 914 have been killed, and 24 have died.

(Approximate).

Veterinary Department, Privy Council Office,
March 31, 1879.

(Signed) G. T. BROWN.

No. 9.

(No. 32, Consular.)

LETTER from SIR E. THORNTON to the MARQUIS OF SALISBURY.

MY LORD, Washington, April 15, 1879.

I HAVE the honour to transmit herewith despatches, as marked in the margin, which have reached this Legation under flying seal from Her Majesty's Consulates at New York and Philadelphia, reporting the existence of pleuro-pneumonia among cattle in the States of New York, New Jersey, and Pennsylvania, and detailing the measures adopted by the Governments of those States to eradicate the same.

Mr. Crump states that the disease which has broken out among the dairy cattle in Pennsylvania, although not to an alarming extent, is pronounced by competent veterinary surgeons to belong to the contagious type of a malignant character.

I have, &c.
(Signed) EDWARD THORNTON.

The Marquis of Salisbury, K.G.
&c. &c. &c.

Enclosure 1 in No. 9.

No. 25.

LETTER from the BRITISH CONSUL-GENERAL at NEW YORK, to the MARQUIS OF SALISBURY.

British Consulate General, New York,
April 8, 1879.

MY LORD,

I HAVE the honour to report to your Lordship that pleuro-pneumonia among horned cattle still prevails in this State, and in some parts of the State of New Jersey. The State Authorities are, however, making all available efforts to extirpate the disease, and inspectors have been appointed with full power to adopt and enforce such measures as may be necessary for its suppression.

I have the honour to transmit, for your Lordship's information, copies of a letter, which has recently been published in the "New York Herald," from Professor Law, of the Cornell University, on the subject of contagious pleuro-pneumonia among cattle and in regard to the measures which he recommended for exterminating the plague.

I have, &c.
(Signed) E. M. ARCHIBALD.

The Most Noble
The Marquis of Salisbury, K.G.
&c. &c. &c.

Enclosure 2 in No. 9.

"NEW YORK HERALD," March 13, 1879.

PROFESSOR LAW ON PLEURO-PNEUMONIA.—ORIGIN AND EXTENT OF THE DISEASE.—EXPENSE OF SLAUGHTERING AND QUARANTINE.

To the Editor of the "Herald":—

As legislation is now pending in the various states infected with the contagious pleuro-pneumonia of cattle, and as there is some danger that legislators who have not for themselves studied the nature of the malady, may be betrayed into sanctioning enactments that will leave the States in question helpless to exterminate the plague, and a continued source of danger and expense to the neighbouring States, I beg that you will allow me space for a few remarks on the subject. These I shall confine to vital points in connexion with the nature of the disease, and the only effectual means of exterminating it.

That the malady is contagious, is shown every day in the course of our work. Wherever we find it existing in a herd, we obtain a history of a recent purchase or of some other form of exposure by which the herd has been infected. To give illustrations would be to record the whole history of our course in stamping it out so far. But this is not enough. The disease is not only contagious, but in this country it is only propagated by contagion. Throughout the immemorial ages of this the oldest of continents, the herds of buffaloes roaming over its plains never contracted this affection. Yet buffaloes are susceptible to the disease as well as our domesticated cattle; and if the buffaloes on the unfenced plains had once developed the malady, it would have remained as a permanent plague, as it has throughout all historic periods in the open steppes of Eastern Europe and Asia, and since 1859 in the wide stock ranges of Australia. During the long period that has elapsed since the colonisation of America, the cattle have been subjected to all the conditions of life that have beset them since 1843, but until that period, when an infected Dutch cow was imported into Brooklyn, the malady was unknown. Since that date it has never at any time been absent from Brooklyn and Long Island. On the contrary, Massachusetts, which imported this animal plague in 1850, set herself vigorously to the work of exterminating it. In the next five years she killed and paid for over one thousand cattle, but in so doing she killed the contagion, and since 1865 has not known this disease.

Never developed in the Western States.

Cattle have lived in innumerable herds in the Western States, subjected to all possible privations and to the greatest trials in the way of travel, crowding, filth, and starvation, but on no occasion has this lung-plague been developed, and to-day I believe the cattle of these States are as sound as are the buffaloes on the plains. In Europe this plague always extends on the occasion of any great war, and devastates the countries through which the armies pass, but only because the commissariat parks are supplied from infected districts. During the late American war, our commissariat herds were subjected to equal privations, with the additional drawback of the absence of the smooth paved roads of the Old World, but the plague never broke out in these herds or ravaged the states where the armies were operating. The explanation is that the cattle supplies were drawn from uninfected regions, and in the absence of the specific imported disease-germ no abuse in America was capable of producing it.

Swill in the West.

The swill-milk stables of the West are as much crowded, as filthy and as ill-ventilated as those of New York and New Jersey. But the swill stables of the West never produce this disease, while those of the seaboard, into which the germ has been introduced, are ravaged to a ruinous extent. If more proof is wanted of the purely contagious nature of the malady, it is to be found in the entire absence of the plague from the Highlands of Scotland, the Channel Islands, Brittany, much of Normandy, Spain, Portugal, Norway, and Sweden. These places breed their own stock, and rarely or never import strange cattle; therefore this poison, exotic to their soil, has never gained a foothold. Norway and Sweden have, indeed, imported the plague, but speedily expelled it by the only effectual method of exterminating the poison. The same is true of a number of other European nations, as well as of Massachussets and Connecticut.

The remark is as true to-day of Western Europe and America, as it was a century ago, when made by the immortal Haller of his own native Switzerland, that the disease never appears but as the result of the introduction into a country or district of an animal from an infected place.

Danger of Half Measures.

This being the case, any temporizing with the poison is in the highest degree injudicious and harmful. In some of our States, laws are enacted against thistles, and you may travel from side to side of such States without once beholding this emblem of agricultural shiftlessness. This success has been attained by attacking the weed in the early stages of its growth, and by preventing any specimen from reaching fructification and diffusing its myriads of seeds. So with with the "bovine lung fever." Incomparably less appreciable and less tangible than the thistle down, the seeds of this disease are being constantly exhaled from the lungs of the sick animal, and the infected air is wafted onward, loaded with a freight of death to every susceptible animal. We may quarantine the sick, but we cannot quarantine the air. We may purify the air, it is true, by an incessant disengagement of disinfectant vapours. But the cost would exceed the value of the sick animal, even if it recovered. We may shut out men and beasts from the infected premises, though even this would be found to be practically impossible when attempted on a large scale, but we cannot absolutely prevent wild animals like pigeons, rats, and mice from eluding our vigilance. We can disinfect the drains and manure heaps, but we can never be sure that every particle of poison has been decomposed, and that if removed or washed away, such products will not infect other animals. When the sick are preserved for any purpose, the poison is being constantly given off in all the products and accumulated in the air in the buildings and in the excretions to such an extent that no watchfulness can at all times guard against its escape. To quarantine the sick is therefore to maintain prolific manufactories of the poison which we wish to destroy, and to open the way for its wide diffusion.

Expense of Quarantine.

But another unanswerable objection to quarantine is its expense. The perfect isolation of sick animals from visitors, human and brute, can only be secured by a patrol to be kept up day and night. Any such course would soon incur an expense greater than the value of the animals sought to be preserved. At the Blissville stable a quarantine of seventeen days cost, in sheriffs and deputies alone, a sum of over $900. At another stable, containing only twelve cows, the sheriff's expenses for fourteen days amounted to $300. If we add to these the expenses of professional examination of the animals, of the treatment of the sick, which is a necessary corollary of the quarantine, of the constant disinfection of the air and excretions, and the repeated disinfection of the buildings, it will at once appear that this method is the most ruinously expensive, as it is the most dangerous and inefficient that can possibly be adopted.

Ineffectual Treatment.

What has been stated of quarantine is a sufficient answer to the demand for the treatment of the sick. Ruinous in its expense, and still more ruinous in its reproduction and propagation of the poison, it should be prohibited under the heaviest penalties in all countries where the extermination of the disease has been determined on. Germany, Holland, Belgium, France, and England have been treating the victims of this plague for nearly half a century, but the result has only been the increase of disease and death. Our own infected States have been treating it for a third of a century, and to-day it exists over a wider area than ever before. Contrast this with the results in Massachusetts and Connecticut, where the disease has been repeatedly crushed out at small expense, and there can be no doubt as to which is the wisest course. As all the plagues are alike in the propagation of the poison in the bodies of the sick, I may be allowed to adduce the experience of two adjacent counties in Scotland when invaded by the rinderpest. Aberdeen raised a fund of £2,000, and, though she suffered several successive invasions, she speedily crushed out the poison wherever it appeared by slaughtering the sick beasts and disinfecting the premises. The result was that little more than half the fund was wanted to reimburse the owners for their losses, and the splendid herds of the country were preserved. Forfar, on the other hand, set herself to cure the plague, with the result of a universal infection, the loss of many thousands of cattle, and the ruin of hundreds of farmers. Finally the malady was crushed out in the entire island by the method adopted by Aberdeen and other well-advised counties at the outset.

Inoculation incompatible with Extermination.

Inoculation is condemned by all those considerations that would forbid quarantine and treatment. Whatever good there is in inoculation depends on the reproduction of the poison in the system of the inoculated animal, so as to render it unsusceptible to a second attack. The inoculated animal is therefore infected, and, like a beast infected in the ordinary way, is a prolific source of the poison and a means of its diffusion. Inoculation has been largely practised in Europe, but no country which has resorted to it extensively has ever succeeded in rooting out the pestilence. Cattle have been inoculated by the tens of thousands in Belgium and Holland, and of all Europe these are the countries most extensively infected. France, Prussia, Italy, Austria, and England have each practised it on a large scale, and each remains a home of the plague. Australia has followed the practice, and is now and must continue an infected country. Our own infected States have inoculated, and the disease has survived and spread it spite of it, and even by its aid. Whatever country has definitely exterminated the plague (Norway, Sweden, Denmark, Holstein, Mecklenberg, Switzerland, Massachusetts and Connecticut) that country has prohibited inoculation and all other methods that prevail on the principle of preserving the sick, and has relied on the slaughter of the infected and the thorough disinfection of their surroundings. So will it be with us. If any State adopts or allows any of these temporizing measures, that State will only repeat the experience of the past, alike in the Old World and New, will perpetuate the disease in the country, will entail great losses on its citizens, will keep up the need for constant watchfulness and great expense by the adjoining States for their own protection, and will indefinitely postpone the resumption of the foreign live-stock trade, which a few months ago promised to be one the most valuable branches of our international commerce. In the present crisis nothing can excuse delay or inefficient legislation or work.. To be successful, all the infected States must act harmoniously, and if any one comes short of a statute and administration at least as thorough as that of New York, on that State will rest the odium of proctracting what cannot but be considered otherwise than as a great national calamity.

Brooklyn, March 10, 1879. JAMES LAW.

Enclosure 3 in No. 9.

(No. 11, Consular.)

LETTER from the ACTING BRITISH CONSUL at PHILADELPHIA to the MARQUIS OF SALISBURY.

MY LORD, British Consulate, Philadelphia, April 12, 1879.

I have the honour to report to your Lordship that there have been several cases of pleuro-pneumonia among cattle in the city and county of Philadelphia during the past few weeks, while in the interior of the State of Pennsylvania the disease has broken out among dairy cattle although not to an alarming extent. This disease is pronounced by competent veterinary surgeons to belong to the contagious type of a malignant character. The State Government are about adopting stringent measures to stamp the disease out, which, it is believed, will be effectually done in a short time.

In the Western States of this Consular District, I have not been able to learn that contagious pleuro-pneumonia exists among any of the cattle herds. Should the disease in the Eastern States, however, not be effectually eradicated, it is but a question of time as to the contagion reaching the West, and there spreading amongst the vast herds whence the cattle for shipments to Europe are drawn.

I have, &c.
(Signed) GEORGE CRUMP.

The Right Hon. the Marquis of Salisbury K.G.,
&c. &c. &c.

No. 10.

LETTER from FOREIGN OFFICE to the CLERK OF THE COUNCIL.

SIR Foreign Office, April 24, 1879.

I AM directed by the Marquis of Salisbury to transmit to you the accompanying note from the United States Minister at this Court, relating to the restrictions at present existing on the cattle trade between the United States and this country, and I am to request that, in laying the same before the Lords of Her Majesty's Privy Council, you will move their Lordships to cause Lord Salisbury to be informed what answer should be returned to Mr. Welsh's Note, the return of which with your reply is requested.

I am, &c.
(Signed) W. LISTER.

The Clerk of the Council,
Veterinary Department.

Enclosure in No. 10.

LETTER from the UNITED STATES MINISTER, LONDON, to the MARQUIS OF SALISBURY.

MY LORD, Legation of the United States, London, April 18, 1879.

THE subject of cattle disease has very properly of late attracted much attention in the United States, and has received the most serious consideration. It has been determined that pleuro-pneumonia, in its contagious form, if it has existed at all, of which there is reasonable doubt, has been limited to certain localities, outside of the line of the cattle trade, and the dread of its consequences has caused in all parts of the Union the exercise of the utmost possible precaution against its spreading, and the use of every possible means for its extinction, so that there is no longer any reasonable ground for apprehension concerning it.

As this particular branch of trade, the live-cattle trade, between the two countries is not less important to Great Britain than it is to the United States, I will place before you a statement which will aid in its intelligent consideration.

The rigid conditions of the order of Her Majesty's Privy Council of the 10th February last must bring to an end the live-cattle trade between the United States and Great Britain. Such a result will of necessity in the first place compel the great cattle herders of the West to seek other markets, other outlets not yet discovered, for the products of this industry, which if found, as they doubtless will be, even though turning out to be less profitable, they may be slow to abandon for a resumption of British markets, presenting so much uncertainty and risk from the possibility of restrictive regulations, which may at any time be renewed without a moment's notice, and when cargoes of great value may be in transit on the ocean. Again, the main lines of railroad from the Missouri river to New York, Philadelphia, and Boston, are seriously affected by any unnecessary interruption in this important traffic, and the interest of the Transatlantic steamers, chiefly British bottoms, in which the cattle are transported directly to England is one that cannot well be lost sight of in any calm consideration of the subject. The pertinence of these observations is at once apparent from a glance at the rapid growth of the cattle export trade of the United States, and the magnitude which it has already attained. In 1871 the export of cattle on the hoof to all countries amounted in value to only $403,491, while for the year 1878 the same export to all countries reached in value to $3,896,818; and of this export in 1878, the proportion to Great Britain was in value $2,408,843, while in fresh beef or slaughtered cattle, the export of which from the United States may be said to have begun in 1874, the value of that article exported to Great Britain in that year was almost nominal, being only $12,661. The export of the same article in 1878 puts up a total to all countries of $5,009,856, the proportion to Great Britain being $4,966,152! With the almost limitless capacity for cattle-raising now available in the vast regions of otherwise unoccupied pasture land west of the Mississippi River, and north of the 37th degree of north latitude, the increase of the business in the immediate future cannot well be estimated, nor can its economic interests to the working classes of Great Britain have wholly escaped the attention of Her Majesty's Government.

It will not have escaped your Lordship's attention that subsequent to the arrival of the "Ontario" many steamers have arrived in England from the United States with cargoes of cattle on the hoof which were found, upon the most rigid examination by the officers of Her Majesty's Privy Council, to be entirely free from contagious pleuro-pneumonia, and even landed in a perfectly healthy condition, although transported through the United States and to the seaboard, and thence across the ocean during the severe winter months; nor will your Lordship have forgotten the doubt expressed by me in my letter to you of the 14th February whether the disease on the "Ontario" was in reality of a contagious character or exceeded in severity what the severity of the voyage ought naturally to have produced. The circumstance of exemption from disease in the cattle which arrived previously to, and also subsequently to, the arrival of the "Ontario," of itself goes far to show that the disease, now creating so much anxiety not unmixed with alarm in Great Britain (pleuro-pneumonia) so far as it may have been found to exist at all in the United States, is spiradic in its character, and is not found in any part of the country to have assumed the form of a cattle-plague or epidemic. Indeed, as in the case of the "Ontario," the rare and exceptional cases of that disease that have developed during the past winter amongst the cattle of the United States may be traced immediately to the exposure and the want of care and irregularity in supplying them food and water while in transit. The season has been unusually severe, and remarkable for heavy snowfalls all over the Northern, Middle, and Western States, and extending as far south as the States of Mississippi and Alabama; and the consequent delay of heavy freight trains on the great East and West lines of railroad over which cattle are shipped rendered this partial neglect in a great measure unavoidable. In like manner, the reports which found their way into the newspapers of Washington and also of New York during the autumn of 1878 in regard to the then alleged prevalence of a disease similar to the rinderpest amongst the cows in the district of Columbia and portions of the States of Maryland and Virginia, and which formed the subject of a note 16th January last, from Sir Edward Thorton to the Honourable Mr. Bates, were found upon careful inquiry by experts, at the instance and under the direction of the Secretary of the Treasury, to be almost if not wholly destitute of foundation. While occasionally there might be found at that time, as there may be found at any time, a diseased cow on a plantation in the region referred to, no such disease as the rinderpest, or any kindred malady, was found to exist among either milch cows or those being fed for the market. None is known to exist now, although careful scrutiny is still being exercised. The report itself, when traced to its original source, was discovered to have emanated from a superserviceable and interested individual, who sells milk in Washington, &c., and possesses some small dairy farms in Virginia, in the neighbourhood of Washington, who from motives that are too obvious desired to impress milk consumers with the belief that that all milch cows in the locality referred to, outside of his own domain, were infected with rinderpest, or some other mortal disease, which rendered the use of their milk deleterious to the public health. There is no doubt that a great deal of misapprehension is prevailing in the public mind of Great Britain, and that to some extent it is shared by the officers charged by Her Majesty's Privy Council with the delicate but arduous duties of the inspection of American cattle on their arrival in British ports. In the hope of at least in part removing the misapprehension, I may add a few facts, without even a seeming reflection on any one here, for while they are perfectly familiar to the Government and people of the United States, they cannot reasonably be expected to be equally well known in England.

In the first place it may be stated with the nearest possible approach to correctness that amongst the live cattle shipped from the United States to Great Britain few or none are raised for or prepared for market east of the Mississippi River. The cattle raised and fed in the States of the Ohio Valley and in the North-western States bordering on the great lakes, find a ready home market in the cities and towns in the immediate neighbourhood of their feeding, and in the New England States, where cattle feeding cannot be properly pursued, and are found it is believed insufficient for the home demand. The cities of Cincinnati, St. Louis, Chicago, Milwaukee, Detrois, Cleveland, and others of only less importance, furnish more than a sufficient market for all the cattle fed in the States referred to, and it is a well-known fact that the State of New York, vast and fertile as it is in area, does not find it profitable to raise beef in sufficient quantities for the supply of the people of that State. So, with equal accuracy it may be alleged that the cattle destined for foreign markets, including the market of Great Britain, which is sure to be not only the principal of these, but greater in its demand than all other countries together, are fed and prepared for exportation in the States and territories of the republic, north of the 36th degree of north latitude and west of the Mississippi River, embracing the States of Kanzas, Nebraska, and Colorado, and the territories of Wyomins, Montana, and Southern Dakota, the prairies and river valleys of which are noted as furnishing the richest and most healthy pasture lands of the world. It is under these exceptionally favorable circumstances that the American cattle trade has so suddenly reached its present and most marvellous proportions, and yet the enterprise may be said to be but in the infancy of its development, for the vast plains of Northern Dakota (through which the Northern Pacific railroad is projected and partly constructed) reaching west to the Red River Valley, as yet untouched, are known to offer even greater inducements to the herdsmen than the lands already occupied. It would seem needless to argue that cattle fed under such conditions, with unbounded range of pasture, pure air, and running water from the streams fed by the mountain snows, must as a rule be healthy and much less liable to contagious disease than those prepared for market in close pastures or stall fed. Moreover, the facilities for introducing and enforcing sanitary measures are greatly increased. If a disease makes its appearance in a herd, the herd can be at once assorted and separated by such a distance as will tend to prevent its spread, the infected cattle can be at once slaughtered, as they would be, for no one knows better than the herdsmen that such present sacrifice is most likely to secure him ultimately against more serious pecuniary loss.

A few words also are necessary to bring fully to your attention the precautionary measures which have already been adopted in the different sections of the Union, under the authority of the Federal and the different State Governments, and in some instancss under city municipal regulations. Leavenworth, Kansas, and Omaha, Nebraska, are the two great entrepôts at which the cattle for exportation are first received by the great railroad transportation lines; those shipped at Leavenworth coming from Kansas and Colorado, and at Omaha from Nebraska, Wyoming, Montuna, and Southern Dukota.

At each of these two shipping points, Leavenworth and Omaha, there has been established an inspection provided for under the laws of Kansas and Nebraska, and no cattle infected with pleuro-pneumonia or other disease are permitted to be forwarded thence to Chicago, while at the latter city, under the regulations of its board of health and the municipal authorities, these cattle again undergo an inspection before being shipped for the port of embarkation at the seaboard. With the arrangements made for inspection at New York, Philidelphia, and other Atlantic ports by the Secretary of the Treasury you are already familiar. With such precautionary measures, enforced with a reasonable degree of faithfulness and energy, as I have no doubt they are (for it is not the interest of the exporter to send to market even a doubtful article), it is quite improbable that any cattle can leave the ports of the United States that are not free from contagious or other disease. The question is one of great interest to the citizens and Government of the United States, and it is believed to be one of equal interest to Her Majesty's subjects in Great Britain.

In closing this statement I will further say to you, my Lord, that I have made it so full because of the earnest desire of the President of the United States that Her Majesty's Government may see the importance and propriety of revoking the order of the 10th February last, subjecting live cattle from the United States to immediate slaughter at the port of arrival, thus removing the present serious interruption to this great element of commerce between the United States and Great Britain, and in which the people of both countries feel so deep an interest.

With sentiments of the highest consideration,

I remain, &c.
(Signed) JOHN WELSH.

The Most Honourable
The Marquis of Salisbury,
&c. &c. &c.

No. 11.

LETTER from the CLERK OF THE COUNCIL to the UNDER SECRETARY OF STATE, FOREIGN OFFICE.

Veterinary Department, Privy Council Office,
44, Parliament Street, Westminster, S.W., April 30, 1879.

Sir,

I have submitted to the Lords of Council your letter of the 24th instant, enclosing note from United States Minister at this Court, relating to the restrictions at present existing on the cattle trade between the United States and this country.

In reply I am directed to state for the information of Lord Salisbury that the Lords of the Council are of opinion that a reply to the note should be to the following effect:

Since the date of the landing of the cattle from the "Ontario," among which contagious pleuro-pneumonia was detected by the inspectors of the Privy Council, the disease has been discovered to exist in several other cargoes of cattle from the United States which have been landed at the ports of London and Liverpool.

The existence of contagious pleuro-pneumonia among cattle in the United States is clearly established by the documentary evidence published in a Parliamentary paper on March 21st 1879.

Under the above circumstances and having regard to the fact to which I referred in my letter of 27th February last that no system of inspection, however perfect, affords complete security against the introduction of pleuro-pneumonia, their lordships regret that they are unable to modify the Order of Council of February 10th relating to the landing of cattle from the United States.

I am, &c.
(Signed) C. L. PEEL.

The Under-Secretary of State,
Foreign Office.

No. 12.

LETTER from the BRITISH CONSUL-GENERAL at NEW YORK, to the MARQUIS OF SALISBURY.

No. 29.

British Consulate General, New York, May 1st, 1879.

My Lord,

I have the honour to report to your Lordship that although pleuro-pneumonia among cattle is still prevalent in this State, the prompt and stringent measures adopted by the State authorities have effected a marked improvement compared with the state of things a few weeks since, and more especially on Long Island, where, according to Professor Law, the disease has been almost extirpated.

The Legislature of the State of New Jersey has passed an Act similar to that of the State of New York; and in that State, as well as in Connecticut, every effort is being made to stamp out the disease.

I have, &c.
(Signed) E. M. ARCHIBALD.

Her Majesty's Principal Secretary of State
for Foreign Affairs, London.

No. 13.

LETTER from the CLERK OF THE COUNCIL to the UNDER SECRETARY OF STATE, FOREIGN OFFICE.

Veterinary Department, Privy Council Office,
44, Parliament Street, Westminster, S.W., May 7, 1874.

SIR,

I AM directed by the President of Council to state that typhoid fever of swine has been detected within the last few days in cargoes of swine from the United States of America landed at the ports of Hull and Liverpool, and to request that you will have the goodness to move Lord Salisbury to direct that this may be communicated to the American Minister, with an intimation that their Lordships will have to consider whether it may not be necessary to deal with swine from the United States, in the same manner as with cattle from that country under order of February 10, 1879.

I am, &c.
(Signed) C. L. PEEL.

The Under Secretary of State,
&c. &c. &c.
Foreign Office.

Enclosure in No. 13.

(467.)

At the Council Chamber, Whitehall, the 10th day of February, 1879.

By the Lords of Her Majesty's Most Honourable Privy Council.

PRESENT:

LORD PRESIDENT; LORD JOHN MANNERS.

THE Lords and others of Her Majesty's most Honourable Privy Council, by virtue and in exercise of the powers in them vested under the Contagious Diseases (Animals) Act, 1878, (in this Order referred to as the Act of 1878,) and of every other power enabling them in this behalf, do order, and it is hereby ordered as follows:

1. This order shall take effect from and immediately after the third day of March, one thousand eight hundred and seventy-nine; and words in this order have the same meaning as in the Act of 1878.
2. This order extends to Great Britain only.
3. Article 13 of the Foreign Animals Order is hereby revoked as far as it relates to cattle brought from the United States of America, and declares that the same may be landed without being subject under the Act of 1878 or under that Order to slaughter or to quarantine.

C. L. PEEL.

No. 14.

LETTER from the BRITISH CONSUL-GENERAL at NEW YORK to the MARQUIS OF SALISBURY.

No. 33.

British Consulate General, New York, June 2, 1879.

MY LORD,

I HAVE the honour to report to your Lordship in regard to the sanitary condition of horned cattle in this Consular District, that the same state of affairs mentioned in my last report still continues. The authorities of the different States are still energetically endeavouring, either by isolating or slaughtering the diseased animals, to stamp out the plague.

The attention of the New York State Commissioner is now more especially directed to some cases of the disease which have appeared among cattle located at East Hampton, Long Island, and its vicinity. A number of cattle there affected with pleuro-pneumonia have been ordered to be slaughtered, and the remainder have been quarantined.

I have, &c.
(Signed) E. M. ARCHIBALD.

Her Majesty's Principal Secretary of State
for Foreign Affairs.

No. 15.

LETTER from the ACTING BRITISH CONSUL at PHILADELPHIA to the MARQUIS OF SALISBURY.

(No. 13, Consular.)

My Lord, British Consulate, Philadelphia, June 3, 1879.

I have the honour to report to your Lordship that casual cases of pleuro-pneumonia among cattle in the State of Pennsylvania have continued to occur during the months of April and May, several cases having been reported since my Despatch of April 12th, No. 11.

The Legislature of Pennsylvania has just passed an Act giving the Governor of the State authority to suppress the disease in any of the counties of the State. For this purpose he has power to issue his proclamation announcing the existence of pleuro-pneumonia or other contagious or infectious disease in any particular county or counties, and to order all persons to seclude afflicted animals in their possession as well as to take such precautions against the spreading of the contagion as the nature of the circumstances may render necessary or expedient, to order premises or farms where the disease exists, or has existed, to be put in quarantine and to prescribe such regulations as may be necessary to prevent its spread; to employ medical and veterinary practitioners and such other assistance as he may deem necessary; to prescribe regulations for the destruction of afflicted animals and for the proper disposition of their hides and carcases and of all objects which might convey infection or contagion. No animal is to be destroyed unless previously examined by a competent medical or veterinary practitioner in the employment of the Governor, who also has power to prescribe regulations for the disinfection of all premises, buildings, and railway cars, and of all objects from which infection may arise or be conveyed. The Act provides for the payment of all expenses incurred in carrying out its provisions. Animals coming into Pennsylvania from a neighbouring State that have been examined and passed by the legal examiner of such State, or that have been quarantined and discharged are not subject to the provisions of the Act.

Active steps are about to be taken under this law, and it is confidently hoped that the disease known as pleuro-pneumonia will be effectually eradicated from the State of Pennsylvania in a short time.

I have received no returns showing the existence of any contagious disease among cattle in the other six States of this consular district.

I have, &c.
(Signed) GEORGE CRUMP.

The Right Hon. the Marquis of Salisbury, K.G.,
&c. &c. &c.

No. 16.

LETTER from the ACTING BRITISH CONSUL at PHILADELPHIA to the MARQUIS OF SALISBURY.

(No. 16, Consular.)

My Lord, British Consulate, Philadelphia, July 8, 1879.

I have the honour to report to your Lordship that during the month of June there were a few cases of pleuro-pneumonia among cattle in the State of Pennsylvania.

In the Western States of this consular district, however, no cases appear to have occurred so far as it has been in my power to ascertain.

The cattle shipped from this port to the United Kingdom are exclusively from the Western States. They remain in the city but a few hours and have been found on arrival to be free from disease.

I have, &c.
(Signed) GEORGE CRUMP.

The Right Honourable
The Marquis of Salisbury, K.G.,
&c. &c. &c.

No. 17.

LETTER from the ACTING BRITISH CONSUL-GENERAL at NEW YORK to the MARQUIS OF SALISBURY.

No. 41.

My Lord, British Consulate General, New York, August 12, 1879.

I have the honour to report to your Lordship that during the past month fresh cases of pleuro-pneumonia among cattle have been reported in the State of New Jersey in this consular district, more particularly in the countries of Bergen, Essex, and Hudson, which countries have been quarantined by the State Inspector in order to prevent the spreading of the disease. The Inspector in his report to me on the subject, states that pleuro-pneumonia exists also in other parts of the State, but that the largest number of cases occur in the above-mentioned countries. He further observes that so soon as sickness is reported among the herds a veterinary surgeon is despatched to the spot to inspect to animals and separate the sick from the well, and quarantine the place, the herds being re-inspected from time to time.

In regard to the state of New York, I have nothing to add to the reports heretofore made by Mr. Consul-General Archibald.

I have, &c.
(Signed) J. PIERREPONT EDWARDS,
Acting Consul-General.

Her Majesty's Principal
Secretary of State for Foreign Affairs.

No. 18.

LETTER from the ACTING BRITISH CONSUL at PHILADELPHIA to the MARQUIS OF SALISBURY.

(No. 18, Consular.)

My Lord, British Consulate, Philadelphia, August 12, 1879.

I have the honour to report to your Lordship that the disease pleuro-pneumonia among cattle has been decreased in Pickering Valley, near Phœnixville, county of Chester, Pennsylvania, within the past month, and that the Governor of the State has ordered four head to be killed and others, together with three farms, placed under quarantine.

On the farm of Mr. Richard L. Jones, at Darby, near Philadelphia, nine head have died within a few weeks, making twenty head in all lost by Mr. Jones this year. Some of the above-mentioned nine head were killed by order of the Governor, and paid for by the Commonwealth.

I beg to enclosure your Lordship three printed copies of a circular issued by the Secretary of the Board of Agriculture of Pennsylvania, by command of the Governor. The circular is addressed to the owners of cattle, their agents, servants and employés, common carriers by land or by water, veterinary surgeons, and all others interested; it requests these persons to promptly report all cases, or supposed cases, of disease among neat cattle of a contagious or infectious nature, and states that the laws of 1866 and 1879 are to be fully enforced. The powers granted the Executive under these laws are clearly stated in a letter from Governor Hoyt to the Secretary of the Board of Agriculture, dated May 1st, 1879, copies of which I beg herewith to enclose.

The prompt killing of the diseased animals seems to check the progress of the disease in any herd in which it has broken out, and in such instances it is not long before the herd can be safely released from quarantine. In no case has the infection spread from the herd after it was placed under quarantine by the authorities, and it is believed that a strict quarantine and the prompt destruction of all diseased animals before the disease becomes contagious, will effectually prevent any further spread of the malady.

I have, &c.
(Signed) GEORGE CRUMP.

The Right Honourable
The Marquis of Salisbury, K.G.
&c. &c. &c.

Enclosure 1 in No. 18.

CIRCULAR issued by the PENNSYLVANIA BOARD OF AGRICULTURE.

Important to Dealers in Cattle.—It having been ascertained that an infectious and contagious disease of neat cattle, known as pleuro-pneumonia, exists in certain counties of this State, Mr. Thomas J. Edge, secretary of the Pennsylvania Board of Agriculture, on May 1st., was appointed by Governor Hoyt as his assistant for the purpose of carrying out the provisions of the Acts of 1866 and 1879, for the prevention of the spread of this disease.

The following circular has been issued by Mr. Edge:

OFFICE OF PENNA. BOARD OF AGRICULTURE, HARRISBURG, August 8, 1879.—To all owners of cattle, their agents, servants, or employés; to all common carriers by land or water; to all veterinary surgeons, and to all others whom it may concern:—His Excellency Governor Hoyt, having decided to co-operate with the Executive Officers of the States of Massachusetts, Connecticut, New York, and New Jersey, in a united effort to eradicate the disease known as pleuro-pneumonia from the herds of this State, it becomes my duty, under the foregoing commission, to request that you will promptly report to me all the cases of disease among neat cattle by you suspected to be contagious or infectious. Without your co-operation and assistance, this attempt can only result in partial success; with it, the result can scarcely be doubtful, and the work thus far accomplished gives us assurance of good results.

His Excellency is anxious that all owners of cattle and others interested should be fully impressed with the belief that this Commission, as well as the laws of 1866 and 1879 for the prevention of the spread of the disease, are in their interest, as well as that of the State. It is also the wish of his Excellency that, while the provisions of these laws are fully enforced and made most effective, and their purposes promptly and fully accomplished, it shall, at the same time, be so managed as to cause the least possible inconvenience and injury to all concerned, and with a minimum of expenditure to the State.

I would particularly call your attention to the language used by his Excellency in relation to the line of action to be pursued when interested parties have concealed the existence of the disease in their herds. This provision is very important, not only to the stock owner, but also to the State, for while the concealment of the existence of the disease will result in pecuniary loss to the owner of the stock, it, at the same time, greatly increases the danger of infection, and the subsequent expense of the State. With your active co-operation in this respect we may hope for the prompt suppression of a disease which, while it has already caused a great loss to our stock owners, will, should it become established in our Western States, inflict an incalculable and lasting injury to the stock-raising interests of the whole nation. So far as known, all infected herds in this State have been quarantined and all diseased animals promptly isolated or killed. In the future, as in the past, it will be our duty to cause as little injury and inconvenience to the owners of stock as is consistent with our duties to the State, and to carry out, to the full letter, the directions of his Excellency relative to the valuation of all stock condemned and killed.

All reports of supposed infection should be made direct to the office, and all interested are requested to accompany the report with a correct and full account of the location of the herd and symptoms, in order that all unnecessary expense to the State may be avoided. No special line of action has yet been marked out for application to cattle in motion from one portion of the State to another, or to those in transit to other States, but it will be the duty of those in charge to cause the least possible inconvenience consistent with the best interests of the State.

Hoping that the subject may receive that attention from you which its national importance warrants.

I am, &c.
(Signed) THOMAS J. EDGE.
Secretary, Pennsylvania Board of Agriculture.

Enclosure 2 in No. 18.

COMMONWEALTH OF PENNSYLVANIA, EXECUTIVE CHAMBER HARRISBURG, May 1, 1879.

To Thomas J. Edge, Secretary Pennsylvania Board of Agriculture—

SIR, it having been ascertained that an infectious and contagious disease of neat cattle known as pleuro-pneumonia has been brought into and exists in certain counties of this State, I hereby appoint you as my assistant to carry out the provisions of the Acts of 1866 and 1879 for the prevention of the spread of this disease. As such assistant you are hereby authorised:

To prohibit the movement of cattle within the infected districts, except on license from yourself after skilled veterinary examination under your direction.

To order all owners of cattle, their agents, employés or servants, and all veterinary surgeons to report forthwith to you all cases of disease by them suspected to be contagious, and when such notification is received you are directed to have the case examined and to cause such animals as are found to be infected with said disease to be quarantined, as also all cattle which have been exposed to the infection or contagion of said disease, or are located in an infected district, but you may in your discretion permit such animals to be slaughtered on the premises and the carcasses to be disposed of as meat, if, upon examination, they shall be found fit for such use.

You may prohibit and prevent all persons not employed in the care of cattle therein kept from entering any infected premises. You may likewise prevent all persons so employed in the care of animals from going into stables, yards, or premises where cattle are kept other than those in which they are employed. You may cause all clothing of persons engaged in the care, slaughtering, or rendering of diseased or exposed animals, or in any employment which brings them in contact with such diseased animals, to be disinfected before they leave the premises where such animals are kept. You may prevent the manure, forage, and litter upon infected premises from being removed therefrom, and you may cause such disposition to be made thereof as will, in your judgment, best prevent the spread of the disease. You may cause the buildings, yards, and premises in which the disease exists or has existed to be thoroughly disinfected.

Your are further directed, whenever the slaughter of diseased animals is found necessary, to certify the value of the animal or animals so slaughtered, at the time of slaughter, taking into account their condition and circumstances, and to deliver to their owner or owners, when requested, a duplicate of such certificate. Whenever any owner of such cattle, or his agent or servant, has wilfully or knowingly withheld or allowed to be withheld notice of the existence of said disease upon his premises or among his cattle, you will not make such certificate.

You are also directed to take such measures as you may deem necessary to disinfect all cars, vehicles, or movable articles by which contagion is likely to be transmitted. You will also take such measures as shall insure the registry of cattle introduced into any premises on which said disease has existed, and to keep such cattle under supervision for a period of three months after the removal of the diseased animal and the subsequent disinfection of said premises.

You are further authorised and empowered to incur such expenses in carrying out the provisions of the foregoing orders as may in your judgment appear necessary, and to see to it that all bills for such expenses be transmitted to this department only through yourself, after you have examined and approved the same in writing.

(Signed) HENRY M. HOYT,
Governor.

Attest:
J. R. MCAFEE, Deputy Secretary of the Commonwealth.

No. 19.

LETTER from the BRITISH CONSUL-GENERAL at NEW YORK to the MARQUIS OF SALISBURY.

No. 43.

British Consulate General, New York,
September 1st, 1879.

MY LORD,

I HAVE the honour to report to your Lordship that there has been no material change in the sanitary condition of cattle in this consular district since the transmission of Mr. Acting Consul-General Edwards' Despatch, No. 41, of the 12th ultimo.

I have, &c.
(Signed) E. M. ARCHIBALD.

Her Majesty's Principal Secretary of State
for Foreign Affairs, London.

No. 20.

LETTER from the BRITISH CONSUL-GENERAL, at NEW YORK, to the MARQUIS OF SALISBURY.

(No. 46, Consular.) British Consulate General, New York,

My Lord, October 1st, 1879.

I have the honour to report to your Lordship, in regard to the sanitary condition of cattle in this consular district, that, while certain localities still remain affected with pleuro-pneumonia, there is reason to believe that owing to the vigorous and persistent measures of the authorities the number of cattle suffering from the disease is declining in this city and its environs; the disease has certainly decreased.

At a meeting on the 16th instant of the American Veterinary Association in this city, it was stated by one of the cattle inspectors that, up to the 1st instant the number of infected stables discovered in this city was 67, out of a total number of 1,100 stables; and the number of infected cattle, 470. The Commissioner for New Jersey, in giving the results of his experience in that State, reported he had examined 15,000 animals since last spring, quarantined 112 herds containing 874 animals, and registered 325 cases of actual pleuro-pneumonia.

Dr. Taylor, of the Bureau of Contagious Diseases, describing the manner in which the disease spreads from the city stables, makes the following observations:—

"Each stable gets fresh cows from the stock-yards, buying on credit, with the privilege of returning a cow if she is not satisfactory. Sometimes a cow is kept in a stable two or three days, exposed to the disease there, and then returned to the stock-yard, to be sent to New Jersey or some other State where the disease appears in her, and she infects a whole herd. As the proprietor of the stock-yard has forgotten his transaction with the city stable keeper, the disease is not traced to its source, but is set down as spontaneously generated. By oversights like this the disease is carried to all parts of the surrounding country from the city stables, when raging here, and the epidemic breaks out at many points almost simultaneously, giving rise to the notion that it originates in meteorological disturbances."

At the meeting above mentioned a proposition was made to secure the foundation of a National Bureau of Veterinary Inspection, and a committee was appointed to take action in the matter.

The New York Central Railway Company have, at the suggestion of the State Inspector, built stables on their land, in this city, in order to keep city cattle from coming in contact with cattle coming from the West. In these stables the cattle forwarded over the railroad are quarantined and can easily be inspected before they are sold.

I have, &c.

(Signed) E. M. ARCHIBALD.

Her Majesty's Principal Secretary of State
for Foreign Affairs.

No. 21.

LETTER from FOREIGN OFFICE to the CLERK OF THE COUNCIL.

Sir, Foreign Office, October 4, 1879.

I am directed by the Marquis of Salisbury to transmit to you for any remarks which the Lords of Her Majesty's Privy Council may have to offer thereupon, a Despatch from the Acting British Consul at Philadelphia, containing a report on contagious diseases among cattle in the month of August last.

The enclosure in Mr. Crump's Despatch, the return of which is requested, has been sent to the Board of Trade as bearing upon a question of quarantine upon human beings and merchandise.

I am, &c.

(Signed) JULIAN PAUNCEFOTE.

The Clerk to the Council,
Veterinary Department.

Enclosure in No. 21.

LETTER from the ACTING BRITISH CONSUL at PHILADELPHIA to the MARQUIS OF SALISBURY.

(No. 19, Consular.)

MY LORD, British Consulate, Philadelphia, September 8, 1879.

I HAVE the honour to report to your Lordship that during the month of August but few cases of pleuro-pneumonia have occurred in the State of Pennsylvania, and that the State Authorities continue to exercise diligence in the endeavour to suppress the disease. Some opposition, however, is experienced on the part of a limited number of veterinary practitioners, stock raisers, and shippers, who contend, first that pleuro-pneumonia is not prevalent in the State, and, secondly, that if there are any cases of the disease, the disease itself is not contagious.

No reports come from the Western States of this consular district that the disease prevails either in Ohio, Illinois, Indiana, Michigan, Iowa, or Wisconsin, although it is not improbable that among the immense herds of cattle mustered at the Chicago stock-yards some of the cattle are attacked, but as they are forwarded to the Eastern markets for immediate consumption or foreign shipment, care being taken that none but healthy cattle are placed on ship-board, but little is thought of it, and there is no desire on the part of dealers too have the inspections too sweeping.

An interesting legal decision has been rendered by the Supreme Court of the State of Illinois as to the right of a State to protect itself from contagious diseases. It declares that all State laws interfering with the free interchange of commerce between the different States are contrary to the constitution of the United States, and shows that any legislation for the purpose of suppressing contagious diseases among cattle, to be effective must emanate from the Congress of the United States. Under this decision it would appear to be very difficult, if not impossible, for any State to enact laws touching upon the transportation of diseased cattle, sheep, swine, or other farm animals without infringing upon the rights or attempting to control the property of citizens of other States. So far as such laws affect only the people and property of their own State they may be effective, but when they affect the commerce between different States, they come in contact with the constitution of the United States, and are, therefore, invalid. I beg to enclose your lordship the only printed copy of this decision I have been able to obtain.

In connection with this report I beg to add a word with regard to the increasing trade in cattle with England, the receipts of cattle at the stock-yards in Chicago and the prices prevailing compared with those of last year. The shipments to Europe are largely on the increase. During the eleven months ending May 31st, 1879, there were shipped from the United States 118,423 head, selling for 1,470,000*l.* compared with 64,824 head during the same period in 1878, which sold for only 580,000*l.*, showing an increase of 90 per cent. and a larger price per head. The receipts of cattle, hogs, and sheep at the Chicago stock-yards since January 1st, 1879, compared with the same in 1878 are as follows:—

1879.

—	Cattle.	Hogs.	Sheep.
January - -	86,547	996,389	30,669
February - -	94,636	463,799	40,280
March - - -	80,290	364,512	38,041
April - -	96,247	326,464	33,799
May - - -	103,393	537,785	18,556
June - - -	92,932	537,611	22,035
July - - -	122,998	277,724	17,646
August (27th) - -	86,666	224,570	17,575
	763,711	3,728,854	218,601

1878.

—	Cattle.	Hogs.	Sheep.
January - -	78,835	879,317	36,530
February - -	82,536	579,161	29,192
March - - -	79,958	342,462	30,902
April - - -	92,479	371,969	23,636
May - - -	97,148	438,608	20,321
June - - -	81,376	547,727	17,109
July - - -	96,369	325,239	18,019
August - - -	84,188	303,572	21,875
	692,889	3,788,055	197,584

The prices for cattle ranged as follows :—

—	1879.	1878.
Extra graded steers	$5.00 to $5.25	$5.00 to $5.50
Choice steers	4.75 „ 4.95	4.60 „ 4.85
Good steers	4.50 „ 4.70	4.30 „ 4.50
Fair steers	4.20 „ 4.40	3.75 „ 4.15
Common steers	3.50 „ 4.00	3.00 „ 3.50
Corn-fed Texans	2.80 „ 3.60	3.20 „ 3.70
Thorough Texans	2.60 „ 3.10	2.75 „ 3.15
Native butcher cows	2.25 „ 3.75	2.50 „ 3.75
Veal calves	3.00 „ 4.50	3.50 „ 5.00
Milch cows, per head	15.00 „ 35.00	20.00 „ 40.00

The cost of raising cattle in the distant West is very small. In the territory of Montana it is only 60 cents per head. A three year old beef steer, including payment of taxes, which will sell on the ground for $30 per head, costs but $2 for feed and care. The losses in raising are estimated at 2 per cent., while the profits vary from 25 to 40 per cent. per annum. In 1873 there were but 86·944 head of cattle in the territory, and in 1878 there were 250,000 head, and 22,000 head having been exported.

I have, &c.
(Signed) GEORGE CRUMP.

The Right Honourable
The Marquis of Salisbury, K.G.
&c. &c. &c.

No. 22.

LETTER from the CLERK OF THE COUNCIL to the UNDER SECRETARY OF STATE, FOREIGN OFFICE.

Veterinary Department, Privy Council Office,
44, Parliament Street, Westminster, S.W.
October 6, 1879.

SIR,

I AM directed by the Lords of the Council to request that you will have the goodness to move Lord Salisbury that representation may be made to the Government of the United States of America, that it has been reported to their lordships that foot-and-mouth disease has been detected by the Inspectors of the Privy Council among the following cargoes of sheep landed in the port of Liverpool from Boston, namely, July 3rd, ship "Bulgarian"; September 19th, ship "Bulgarian"; September 24th, ship "Pembroke"; September 26th, ship "Palestine"; and October 4th, ship "Brazilian."

That, having regard to the provisions of the Contagious Diseases (Animals) Act, 1878, with respect to the importation of foreign animals, their Lordships regret that, should any further consignments of diseased sheep arrive from the United States, they will consider themselves compelled to issue an Order of Council treating sheep in the same manner as cattle and swine are now treated from that country, that is to say, that they shall be landed only at a foreign animals wharf for slaughter.

I am, &c.
(Signed) C. L. PEEL.

The Under Secretary of State,
&c. &c. &c.
Foreign Office.

No. 23.

LETTER from the CLERK OF THE COUNCIL to the UNDER SECRETARY OF STATE, FOREIGN OFFICE.

October 10, 1879.

SIR,

I HAVE submitted to the Lords of Council your letter of the 4th instant, transmitting, for any remarks their Lordships may have to offer thereupon, a Despatch from the Acting British Consul at Philadelphia, containing a report on contagious diseases among cattle in the month of August last.

In reply, I am directed by their Lordships to observe, for the information of Lord Salisbury, that so long as the various States are unable to make laws against the introduction of disease. and so long as no general law exists on the subject, it is impossible for the Privy Council here to be satisfied, as required by The Contagious Diseases (Animals) Act, 1878, "that the laws thereof relating to the importation and "exportation of animals, and to the prevention of the introduction or spreading of "disease," . . . . . "are such as to afford reasonable security against the importation "therefrom of diseased animals." Had the state of things represented by the legal decision referred to by Mr. Crump been understood to exist in 1878, the United States of America would not have been included in Part IV. of The Foreign Animals Order, the Privy Council having then been informed that every State had power to make its own regulations.

I beg to return, herewith, Mr. Crump's Despatch, and am directed to request that the Lords of Council may be favoured with a copy of the legal decision therein referred to.

I am, &c.
(Signed) C. L. PEEL.

The Under Secretary of State,
&c. &c. &c.
Foreign Office.

No. 24.

LETTER from the BRITISH CONSUL-GENERAL at NEW YORK to the MARQUIS OF SALISBURY.

(No. 48.)
British Consulate General, New York,
October 9, 1879.

My Lord,

I have the honour to transmit, herewith enclosed, for your Lordship's information, copies of a publication in the "New York Times" of this morning reporting a serious outbreak of pleuro-pneumonia among cows in Putnam county in this State.

The origin of this outbreak is doubtful, some persons attributing it to a herd of cattle which had been brought from Buffalo by way of Albany some months since. The farmers and others interested are alive to the importance of extirpating the disease, and are taking vigorous measures for that purpose under the superintendence of General Patric, the State Commissioner. It is to be feared, however, that the disease will yet make its appearance in other quarters through the spreading of the infection from Putnam County.

In the State of New Jersey also a fresh outbreak of pleuro-pneumonia is reported to have taken place, and, according to a recent statement in the newspaper, is "making "frightful ravages among cattle in the neighbourhood of Forked River in that State, "nearly every herd in the place being lessened by the malady."

In this city, through the energetic means adopted and measures enforced by General Patric, it is reported in the newspapers that the disease has almost disappeared.

I have, &c.
(Signed) E. M. ARCHIBALD.

Her Majesty's Principal Secretary of State for Foreign Affairs,
Foreign Office.

Enclosure in No. 24.

"New York Times," October 9, 1879.

The Plague among Cattle.—Three Towns Quarantined in Putnam County.

Thirty-three Deaths reported.—Mass-meeting at Brewster to consider the Situation.—A gloomy Outlook for the Farmers.—The Disorder undoubtedly contagious.

Putnam County has been in a state of ferment for the last three weeks, in consequence of the advent of the dreaded cattle plague—contagious pleuro-pneumonia. The farmers at first declined to call the disease that had begun to decimate their herds by that terrible name, and insisted it must be something else; but three weeks ago Prof. Law, of Cornell University, Veterinary Assistant to State Commissioner Patrick, appeared on the scene, and, after a thorough investigation, both on the living and the dead subject, pronounced the disease to be contagious pleuro-pneumonia beyond peradventure. The doleful tidings aroused the whole community to action, for the wealth of Putnam County (politically a part of New York State, and geologically, topographically, and socially a part of Connecticut) lies in its grazing and dairy interest, and to strike at that is to menace the well-being of every town in the county. There are facts which give this outbreak a very special importance to the people of New York City, particularly as the milk of cows infected with the disease has been pronounced a perilous article of diet by competent scientific authorities. Although the New York market derives less milk from Putnam County than from several others, Orange among them, this tract is nevertheless, one of the large sources of supply; directly shipping large quantities in the fresh state, in the first instance, and being, in the second instance, the main source from which the condensing establishment belonging to the Borden Condensed Milk Company derives it stock. The factory is situated at Brewster's Station, a thriving place of about 1,500 inhabitants, and has proved a leading source of revenue to the farmers in the immediate vicinity.

The current news of the outbreak must first be briefly recounted, and then it will be in order to inquire into the causation, and describe the symptoms of the disease. After Prof. Law had made due examination about three weeks ago, and suggested certain necessary precautions, a week ago last Saturday Dr. Hopkins, one of the cattle inspectors in this city, under the control of Gen. Patrick, was sent to Putnam County, with a view to co-operate with the local authorities in stamping out the plague. Gen. Patrick issued an order last week quarantining three of the towns in which the infection had appeared, to wit: Philipstown, Kent, and Patterson. There are some cases in the town of Carmel, and a few, it is stated, in the town of Southeast, but in the latter so far the infected herds only have been quarantined. There were some difficulties in the way of instituting a wholesale slaughter of the infected animals, the principal one being that the appropriation placed at Gen. Patrick's disposal by the Legislature last winter has been exhausted by the campaign in this city and on Long Island, and there was no money in the treasury from which to indemnify owners according to law. The compensation is not an extravagant one—two-thirds of the appraised value of each animal at the time when the death is effected—but such as it is, the obligation is peremptory, and cannot be postponed or evaded without the consent of the parties. Gen. Patrick went to Albany and laid the circumstances before the Governor, asking him to transfer to the use of the commission an unexpended balance from another fund. The time was inauspicious, however. In the midst of an excited political canvass such a transfer might have been quoted by political enemies, and, as between votes and cattle, a well-regulated Gubernatorial candidate usually prefers the former.

This project having failed, Gen. Patrick, accompanied by Dr. Hopkins, returned to Putnam County on Tuesday, and that night a large mass-meeting of the citizens was held at Brewsters for the purpose of taking counsel upon the situation, which is, in reality, a rather desperate one. At this meeting Gen. Patrick addressed the people of the county, explaining the imminence of the peril as based upon American and European experience with the disease, and advising that the Board of Supervisors should meet at the earliest practicable moment, passing a resolution pledging the county to indemnify owners, and take such other measures as might be considered necessary to the extirpation of the pest. Mr. John D. Borden, who participated in the meeting, immediately arose and offered to advance $10,000 to the county officers to be expended under the advice of Gen. Patrick in uprooting the disease, and others came forward with smaller amounts. It was finally concluded to call the Board of Supervisors together, and they met at Carmel yesterday. Some of them expressed doubts as to the legal right of the board to pledge the credit of the county in such an emergency, but all agreed, in conversation with the representative of "The Times," that something must be done, some responsibility taken, and that there was no other practicable remedy except for the county to become security for the compensation and trust to the State to be reimbursed by special appropriation. The board met late in the afternoon, all the members being present. It is composed as follows: J. E. Taylor, of Paterson; Wellington Kent, of Kent; Daniel Baker, of South-east; Jackson Perry, of Putnam Valley; A. Hazen, of Carmel, and G. Spaulding, Phillipstown. Dr. Hopkins was present at the meeting, which was a very harmonious one, and resulted in a resolution to co-operate with the State Commissioner in any measures that he might deem most efficient to prevent the further progress of the pestilence. Yesterday morning Gen. Patrick, with Dr. Hopkins, Sheriff Doune, and others, proceeded to the farm of Freeman Sprague, in the town of Kent, about 10 miles from Brewster, and slaughtered six infected cows. Twenty-seven animals had either died of the disease or had been slaughtered previous to yesterday's raid upon Sprague's herd, and there are probably 50 in the various stages of the disease among the several infected herds, while from 150 to 200 have been exposed to the contagion. Indeed, the number of exposures cannot be stated with any degree of certainty. The plague was in Sprague's herd at the date of the county fair held at Carmel on September 17, and as Mr. Sprague was one of the exhibitors, and the period of incubation in contagious pleuro-pneumonia varies from 10 to 12 days to as many weeks, how widely its *semina* were scattered on that occasion the experience of the next few weeks can alone determine. The origin of the disease is a matter of doubt. but it appears to have radiated from three centres in as many different towns. It broke out about the middle of July in the herd of Mr. Sprague in Kent, but he pooh-poohed the suspicion that it was contagious, and commenced doctoring the victims on his own responsibility. Out of a herd of little more than 40 he had lost 15 by the disease. Its origin in this quarter is attributed to a strange herd of cattle which Mr. Sprague sheltered over night early in June. They came from across the river, bnt neither their destination nor from what point they came has been ascertained. Mr. Sprague is very reticent respecting the disease in his herd, and gives information piece-meal.

Mr. G. W. Patrick, living on the extreme eastern border of Paterson, had a case about the middle of January. The animal had been in his possession eight months without showing any signs of disease, and was originally bought from a farmer residing near by. He bought three cows a few days before this case occurred, but neither of the three has shown any symtoms of pleuro-pneumonia, and he is loath to believe that the seeds of the plague were brought into his barn by them. His cattle, so far as he knows, have had no contact with strange cattle. His herd numbers between 40 and 50. In the herd of Mr. Alvah Hyatt, in the town of Carmel, the disease was first observed some two weeks ago. His herd numbered about 40, among which a few deaths have already occurred. Mr. Hyatt and Mr. W. J. Robinson, also a large owner, have tried inoculation in about 20 cases, but sufficient time to determine its value as a prophylactic has not yet elapsed. The process was the same as that used in the great Australian epidemic two years ago, by Prof. Coleman, now of the New York College of Veterinary Surgeons—namely, by making an incision in the tail and introducing into the wound a pellet of cotton saturated with the sputa of the sick animal. Further experiments in this direction have been forbidden by Gen. Patrick, on the ground that ample experience has discredited the value of the measure, and that it may possibly tend to spread the disease.

The preceding review of the circumstances under which the disease made its appearance leave one altogether in the dark as to the mode of introduction. There are those, however, who state very positively that it originated from some Western cattle which had been herded at Buffalo and arrived in the neighbourhood some months since by way of Albany. The first animal that was taken sick in Mr. Patrick's herd came from the town of South-east, where there are now cases among the herds. Of the animal's previous history he is not informed, nor was there at the date of the transaction any disease, so far as he knows, on the farm from which it was taken. But, as one of the supervisors remarks, the contagion must have been introduced from some quarter without the limits of the county, for no cases of it have occurred there for years, and it is not self-developing. Perhaps the official inquiries of Gen. Patrick, Prof. Law, and Dr. Hopkins, may ultimately bring out this important point. It is very unlikely that the two earliest centres of infection—the one situated in Kent near the western border of the county, and the other in Patterson near its eastern—had a common origin; the two points being many miles apart, and the intervening tract having been comparatively free from the disease until very recently. Contagiousness is demonstrated beyond a doubt by the progess of the disorder in the herds where it has appeared, and by its travelling from herd to herd, in the slow but irresistible manner so familiar to veterinary experts. While Mr. Sprague has been very severely blamed for not having consulted a competent practitioner at the inception of the plague in his herd, it is true that the first sporadic cases of pleuro-pneumonia are usually too insignificant to attract the attention of a busy man. The animal often effects an apparent recovery sponstaneously after more or less prolonged illness, and no suspicion as to the deadly nature of the disease is raised. In such cases the disorder re-appears under peculiar circumstances in the same animal. She aborts with calf early during the period of gestation, fever sets in, and pleuro-pneumonia developes itself. On post-mortem the lung is found to be a mass of putrid matter encysted. This termination occurs weeks or months after the first sickness, and contagion has already affected the whole herd.

The symptoms of the present disease are distinctly those of contagious pleuro-pneumonia. The victim commences dripping at the nose an abundant and rather glairy secretion, stands with her feet wide apart and braced and her head depressed. The breathing is rapid and laboured; the eyes are dull and filmy, and senses stupefied. The cause of death is either suffocation or asthenia. On autopsy, one lung, and generally the right one, but sometimes the left, and sometimes both, is found either to have undergone complete hepatization or to have become a mass of encysted gangrene. The colour is occasionally mottled, but usually a deep liver red. The gastric cavity in severe cases is filled with a glairy secretion resembling that seen in yellow fever, and putridity of all the tissues follows rapidly upon death. All these are points too significant to be mistaken. In its reception in the county the disease showed a marked tendency to attack tuberculous animals, and the autopsy demonstrated frequent tuberculous complications: but since it has approximated the epidemic or epizootic form it attacks sound and tuberculous with the same virulence. As, however, according to Prof. J. M. Heard, who speaks on the concurrent testimony of personal reflection and careful inquiry, the average of tuberculous cows is about 15 in every 100, the material for spread is abundant at the beginning. From Putnam County experience, the mode of propagation appears to be by means of the specta. The grass in pastures becoming covered more or less with the diseased secretion, the healthy animal receives it into the system with its food, and is thus solely impregnated with it. Tubercular disease passes from animal to animal in the same way, according to Fleming. Vigorous measures have been instituted, but one of the supervisors said yesterday that they were working more in the hope of saving the adjacent counties from attack than from any prospect of arresting the disease in their own county. It is believed that the best measures would be to quarantine the whole tract represented by the Putnam County, and thus save its neighbours from infection.

No. 25.

No. 21 Consular.

LETTER from the ACTING BRITISH CONSUL, at Philadelphia, to the MARQUIS OF SALISBURY.

British Consulate, Philadelphia,
October 11, 1879.

My Lord,

I have the honour to report to your Lordship that for the month of September there have been but few cases of pleuro-pneumonia or other contagious disease among cattle discovered in this Consular district.

In the State of Pennsylvania the Special Commissioner appointed by the Governor has, during the past summer, placed 17 infected herds in strict quarantine under the care of competent veterinary surgeons, and 60 of the animals infected were killed at the expense of the Commonwealth. In most instances this prompt action has prevented further infection, and I believe in no case has the disease spread beyond the herd infected after the quarantine was enforced.

Pleuro-pneumonia has prevailed to some extent in the counties of Chester, Montgomery, Delaware, Lancaster, and Bucks, the infected herds, as soon as discovered, being placed in quarantine. In three herds 48 animals have been lost, and it is now believed that the surgeons have the disease under control. The prompt action in killing the diseased animals appears to have the desired effect.

I have no reports from the States of Illinois, Indiana, Ohio, Michigan, Wisconsin, or Iowa, and it is the general belief that there are no cases of contagious diseases in these States.

I have, &c.
(Signed) GEORGE CRUMP.

The Right Honourable
The Marquis of Salisbury, K.G.
&c. &c. &c.

No. 26.

LETTER from the FOREIGN OFFICE to the CLERK OF THE COUNCIL.

Immediate.

Foreign Office, October 21, 1879.

Sir,

With reference to your letter of the 6th instant, I am directed by Her Majesty's Secretary of State for Foreign Affairs to transmit to you to be laid before the Lords of Her Majesty's Privy Council the accompanying note and its enclosure, which has been

Nos. 1, 2, and 3. received from the United States Chargé d'Affaires at this Court, relating to existence of disease among sheep imported from Boston, and I am to request you to move their Lordships to cause Lord Salisbury to be informed what answer should be returned to Mr. Hoppin, and to return the enclosed papers with your reply.

I am, &c.
(Signed) T. V. LISTER.

The Clerk of the Council,
Veterinary Department.

Enclosure 1 in No. 26.

LETTER from the UNITED STATES CHARGÉ D'AFFAIRES, LONDON, to the MARQUIS OF SALISBURY.

Legation of the United States, London,
October 20, 1879.

MY LORD,

I HAVE the honour to acknowledge the receipt of your letter of the 7th instant informing me that foot-and-mouth disease has been detected by the Inspectors appointed by Her Majesty's Privy Council among five cargoes of sheep imported into Liverpool from Boston, and intimating that should any further consignments of diseased sheep arrive from the United States, the Lords of the Privy Council would feel themselves compelled, however reluctantly, to issue an Order in Council treating sheep in the same manner as cattle and swine from the United States are now treated; and I have to acquaint your Lordship that I lost no time in transmitting to Mr. Evarts the contents of your Lordship's letter.

Meanwhile I ask your Lordship's attention to the copies of two letters written to Mr. Packard, the United States Consul at Liverpool, by Messrs. Leyland & Co. and G. Warren & Co., the managing owners of the steamships which brought the five cargoes of sheep mentioned in your Lordship's letter. It appears from the letters that the percentage of diseased sheep is very small, that a portion of the sheep came from Canada, and that the period for shipment being now nearly over, the new restrictions proposed by the Privy Council may be properly postponed, at any rate, until the next season.

I have, &c.
(Signed) W. J. HOPPIN.

The Most Honourable The Marquis of Salisbury,
&c. &c. &c.

Enclosures.

Copies of letters.—Frederick Leyland & Co., to the United States Consul at Liverpool, October 11, 1879.
George Warren & Co. to the same, October 15, 1879.

Enclosure 2 in No. 26.

LETTER from Messrs. LEYLAND AND COMPANY to the UNITED STATES CONSUL, LIVERPOOL.

Liverpool, October 11, 1879.

SIR,

YOUR favour of the 9th instant received. Our steamers have brought over from Boston 18,310 sheep during the present year of 1879. We do not think it probable we shall bring across any more this year. The sheep, ex "Bulgarian," 19th September, were Canadian. We understand the inspector considered seven sheep to be infected with foot-and-mouth disease of the consignment per "Bulgarian," 3rd July, and 11 of the consignment September voyage. These were the only cases of disease during the year that we are aware of.

We are, &c.,
(Signed) *p.p.* FRED. LEYLAND & Co.,
FRED. W. LEYLAND.

S. B. Packard, Esq.,
United States Consul, Liverpool.

Enclosure 3 in No. 26.

LETTER from Messrs. GEORGE WARREN AND COMPANY to the UNITED STATES CONSUL, LIVERPOOL.

Liverpool, October 15, 1879.

DEAR SIR,

WE beg to hand you herewith a statement of sheep imported by our line of steamers from Boston during the present year to date, showing a total of 30,036.

The sheep by the last three steamers, viz. :—

"Pembroke," 24th September - - - -	1,293 head
"Palestine," 26th September - - - -	212 ,,
"Brazilian," 3rd October - - - -	421 ,,

were all slaughtered at point of disembarkation by order of the Inspector of the Privy Council in consequence of discovery (as alleged by him) of foot-and-mouth disease or scab. As far as our information goes the number of diseased animals discovered by him in these cargoes were—

8 cases of foot-and-mouth disease by the "Pembroke."
3 cases of foot-and-mouth disease by the "Palestine."
2 cases of foot-and-mouth disease } by the "Brazilian."
16 cases of scab - - - }

or a total of 29 cases of disease out of 30,036 imported.

We may mention that a portion of the sheep ex "Pembroke" came from Canada. We may also add that the season for bringing live stock from America is now virtually ended, and we are not likely to carry many, if any, more until next spring.

Trusting these particulars will be of service to you.

We are, &c.
(Signed) Geo. Warren & Co.

S. B. Packard, Esq.,
United States Consul, Liverpool.

No. 27.

LETTER from the CLERK OF THE COUNCIL to the UNDER SECRETARY OF STATE, FOREIGN OFFICE.

Veterinary Department, Privy Council Office,
44, Parliament Street, Westminster, S.W.,
October 25, 1879.

Sir,

I have submitted to the Lords of the Council your letter of the 21st instant, transmitting a note and its inclosure which had been received from the United States Chargé d'Affaires at this Court, relating to the existence of disease among sheep imported from Boston.

In reply, I am directed to state, for the information of Lord Salisbury, that their Lordships regret that, having regard to the health of the live stock of this country they cannot make any exception in favour of animals from the United States, and that they will feel themselves compelled, in the event of another cargo arriving with sheep affected with foot-and-mouth disease from that country, to issue an Order of Council placing sheep under restrictions similar to those which now apply to cattle and swine.

I am, &c.
(Signed) C. L. PEEL.

The Under Secretary of State,
&c. &c. &c.
Foreign Office.

No. 28.

LETTER from the BRITISH CONSUL-GENERAL AT NEW YORK to the MARQUIS OF SALISBURY.

(No. 50.)
British Consulate General, New York,
November 8, 1879.

My Lord,

Referring to my Despatch (No. 48) of the 9th ultimo, I have the honour to report to your Lordship that pleuro-pneumonia still prevails to a considerable extent among cows in Putnam county in this State.

In the State of New Jersey, an improvement has taken place in the sanitary condition of cattle, owing to the energetic action of the Government inspectors in dealing with the disease so soon as it manifests itself in any part of the State.

I have, &c.
(Signed) E. M. ARCHIBALD.

Her Majesty's Principal Secretary of State
Foreign Affairs, London.

No. 29.

LETTER from the ACTING BRITISH CONSUL, at PHILADELPHIA, to the MARQUIS OF SALISBURY.

No. 24 Consular.
British Consulate, Philadelphia,
November 18, 1879.

My Lord,

I have the honour to report to your Lordship that there have been but few cases of pleuro-pneumonia in Pennsylvania during the past month of October, the Special Commissioner of Governor Hoyt having successfully continued his exertions for the suppression of the disease within the State.

Pleuro-pneumonia has not up to this time extended to the Western States of this Consular district, because no eastern cattle go westward. The breeding cattle imported for those States come direct from the Channel Islands, where pleuro-pneumonia, I believe, does not exist.

Mr. Vice-Consul Warrack, of Chicago, reports that in a recent visit throughout the West he did not hear of any cases of the disease in Illinois, Iowa, Michigan, Indiana, or Wisconsin.

Farmers now see the necessity of action by the National Government for the prevention of the spread of pleuro-pneumonia and other contagious cattle diseases to fresh districts. It is proposed to petition the United States Congress from every State in the Union in favour of a stringent national law for the suppression of contagious diseases and the establishment of a bureau with plenary powers. A convention of veterinary surgeons from all the States will shortly be held in New York for the purpose of encouraging this movement.

I beg to enclose for your Lordship printed copy of the proceedings of the American Short Horn Breeders Convention, held at Chicago on the 29th ult. Pleuro-pneumonia was discussed at some length by the members of the Convention. Attention is called to the opinions expressed by a red ink mark made on the enclosed copy, which is the only one I have been able to obtain.

I have, &c.
(Signed) GEORGE CRUMP,

The Right Honourable
The Marquis of Salisbury, K.G.,
&c. &c. &c.

Enclosure in No. 29.

Proceedings of the American Short-horn Breeders' Convention.

At 10.15 a.m., on October 29th, President Christie called a small, but select body of short-horn breeders to order in the club-room of the Grand Pacific Hotel in this city, and the seventh annual convention of American Short-horn breeders commenced its session. It is a matter of regret that this meeting should have occurred at just that date, as was evidenced by the light attendance. But while the attendance was small compared with previous years, it made up in character what it lacked in number, representative men were present, from Canada, and from about a dozen different States.

The unfortunate proximity of the great fat stock show resulted in the absence of many breeders, who could not attend both events. Had the meeting been held during the November show, or had there been a few months of intervening time, there would undoubtedly have been a much larger turnout. However, this was a matter which was beyond the power of the secretary to remedy, as the byelaws of the association itself had fixed the date of meeting. We give below the President's opening address, and an abstract of the discussions.

Upon calling the meeting to order, the Honourable David Christie, of Canada, President of the Association, addressed the meeting as follows:

Gentlemen, As you are aware, at the last meeting of the association it was resolved that the next meeting should be held at Nashville, Tennessee, but owing to the prevalence of that terrible scourge, yellow fever, and in consequence of the urgent remonstrances of many members of the association, the meeting was postponed. The same difficulty occurred this year; in these circumstances, it was deemed proper to consult the directors of the association as to what should be done. The responses were unanimous in naming Chicago as the place of meeting, and certainly, since a wise discretion rendered a change of place necessary, there could be no more fitting place than this great

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* Printed within brackets [ ]. See pp. 49 to 54.

city, easy of access from all parts of the continents; a great cattle mart, the first in the world, and also the leading city in one of the great cattle States of America, a state not surpassed for fertility and for short-horn cattle.

When we last met, the storm of adversity had compassed the length and breadth of the land, and it extended to every branch of business and to each industrial pursuit. The breeders of short-horn cattle felt the full force of the blast. Prices receded to a degree unprecedented in short-horn history. In England, last year, the average of the 64 sales was 57*l.* 5*s.* 9*d.*; 56 of these comprised 39 per cent. of the whole, and averaged 37*l.* 0*s.* 7*d.* One thousand and thirty-one animals averaged less than 30*l.* One animal, Baroness Oxford 5th, brought 2,660 guineas, or more than the individual proceeds of 51 of the 64 sales recorded. So said the *Mark Lane Express.* Our American averages were not much better. Now the storm has passed, and already we have seen the harbinger of prosperous times. A recent short-horn sale in Chicago has given a better average than we have had in America for two years past, and better than the average in England last year. The lesson taught by adversity should not be lost.

> "Sweet are the uses of adversity,
> Which, like the toad, ugly and venomous,
> Wears yet a precious jewel in her head."

Men of the present generation are not likely again to be tempted to over speculation, or to give excessive prices. Another important lesson is not to place unreasoning reliance on mere pedigree, whether of this or that family or tribe, without giving due weight to personal qualities. Pedigree is very important, because it gives a reasonable degree of assurance of the transmission of valuable qualities from parents to progeny; but how can an animal be expected to transmit qualities not possessed by it, but which, according to tradition, may have been the characteristic of some one or more remote ancestors. The old adage, that "Like produces like," commonly holds true; the principles of pedigree is based on it, and rest assured, gentlemen, that the day has come when the presentation of "long pedigree" will not cover the want of distinguished personal qualities. Both together, but neither singly, will satisfy future purchasers. The demand for good animals, of good pedigree, will increase year by year. The demand for a superior quality of beef for export to the British market will compel breeders and feeders to use only good and well-bred animals; because it will neither pay to breed nor to export inferior cattle. With all due deference to the opinions and statements of our Hereford friends, there is no race of cattle which, for early maturity and aptitude to produce, with profit, really first-class beef, can compare with the short-horn. It is one of the promising features in the future of American agriculture, that a line of demarcation is being drawn between the business of breeding and of feeding cattle for beef. The lands in the east, and as far west as the Missouri, are too high-priced to enable farmers to raise beef cattle with profit. On lands worth from $50 to $100 per acre beef cattle cannot be raised with profit. In ordinary circumstances a steer cannot be ready for market until he is three years old, during which period he will cost more than he will bring in market. In Great Britain this is well understood. English and Scotch farmers purchase, at the great fairs, cattle bred in Wales and the Highlands of Scotland, where they can be raised cheaply, and then feed them. They know well that all the profit of stall feeding does not consist in the extra quantity and quality of beef, but in the large quantity of valuable manure produced, and in the better cultivation of the soil for root crops, which, in due time, result in larger returns of grain per acre in succeeding crops. The farmers of Illinois, Indiana, and Ohio, who feed cattle, act on the principle that it is more profitable to purchase than to raise stock for that purpose. They know that they cannot compete with breeders living on the cheap lands of Kansas, Nebraska, and Colorado, and, therefore, they repair to the great cattle marts of Kansas City, St. Louis, and Chicago; at which, any day in October and November, they can purchase all the stock they need for feeding purposes. A few years ago it was difficult to get as many well-bred steers as were needed, therefore recourse to the lean and ill-favored Texan was a necessity, the descendants of the old Andalusian cattle—a race unprofitable to feed, and sometimes bringing with them, as in 1868, "Texan fever," a scourge which desolated large districts of country. Fortunately, during the past ten years, a better race of cattle has taken their place. From the extensive dissemination of short-horns among the western herds, the supply of good cattle is yearly becoming more abundant, and promises soon to keep pace with the demand. This is a most encouraging fact to the breeders of short-horns. Many of the western herds require the services of 60 to 100 bulls, which of course must be replaced by the purchase of others every third year.

If you will permit me to trespass a little on your time, I wish to quote from a report by Professor Brown, of the Ontario Agricultural College, at Guelph, the narrative of an experiment made at the college, last year, in feeding short-horn steers. Professor Brown says: "During the past winter, our school made two experiments in the fattening of "steers. 1st, with four steers of our own breeding, *fore-fifths* prime fat, and nine "tenths bred short-horns. Secondly, with six steers bought in, half-fed, and two thirds "bred short-horns. All the animals were entered on the 8th December, and withdrawn "on the 6th of March, being 87 days—say three months—average age of all 35 months "and 15 days, at latter date. The food consisted of, daily, 90 lbs. of pulped Swede "turnips, 12 lbs. of cut straw, of sorts, and 12 lbs. of crushed Indian corn, given in two "forms—turnips and straw, put in a heap in alternate layers, so as to slightly ferment, "and corn mixed with them when served; and other pulped turnips direct from the "machine. The four steers averaged, on entry, 1,512 lbs., and 1,754 when finished—"thus gaining 242 lbs. in 87 days, being 2 8 10 lbs. per day, or 16 per cent. on their "weight. The six steers, on entry, averaged 1,260 lbs., and 1,492 lbs. when withdrawn "—thus gaining 232 lbs. in 87 days—being 2 7-10 lbs. per day. or 18½ per cent. on "their weight."

So we can make the following balance sheet, according to current market prices, attendance, and manure, to meet each other for safe figuring:

1st example :—	
Cost of straw, $5 per ton	$2.61
Cost of corn, 50 c. per 56 lbs.	8.70
Value of animal when entered, 1,512 lbs., at 5½ c.	82.16
	93.47
1,754 lbs. sold for 6 cents	105.24
Balance to credit	11.77
2nd example :—	
Cost of food as above	11.31
Value of animal when entered, 1,260 lbs., at 3¾ c.	47.25
	58.56
1,492 lbs. sold for 5¼ cents	78.33
Balance to credit	$19.77

(Or a difference in favour of the half-fed steers of $8 per head.)

There is material here for some very nice discussion and comparisons. Let me approximate the conclusions. That well-bred steers, nearly prime fat, gain 3½ per cent. more on the same food than others that are not so well bred, and that were also 6 per cent. less in weight when put in competition; that, in proportion to weight, the half-fed steers gave 58 per cent. more profit than the others; that, according to weight, the half-fed steers gave 2½ per cent more increase than others almost prime; that, in proportion to weight, the half-fed steers ate 18 per cent. more food than the others; that, as an investment, without reference to manure, the matured animals returned fully 9 per cent., and the half-fed ones 40 per cent. on the original cost, being a difference of 31 per cent. in favour of the leaner animals. No doubt there are circumstances for and against each of these conclusions, which it may be well to notice. The previous treatment of our own bred cattle was likely more favourable. The change of place and food was against the others. Their inferiority of breeding might be against them. Note how much fat, heat, and flesh substances of food was required to produce a certain quantity of beef. One animal, in 87 days, ate, flesh, fat, and heat producers :—

Turnips.	Straw.	Corn.	Total.
574 lbs.	441 lbs.	831 lbs.	1,846 lbs.

In the case of the animals, therefore, the 1,846 lbs. of fat, heat, and flesh-forming substances in the three sorts of food seem to have been required to make 236 lbs. of probably the same things in the animal's frame. This we find was one of flesh to seven of fat. There is, then, under proper management, proper food, and with the proper animal, a large profit in growing beef.

It may be remarked, in reference to the foregoing statement, that the profit would have been much larger, had all the steers in question been bred where they could have been produced, at the proper age, at less cost.

I have alluded to the large increase in the trade in beef with Great Britain. From small beginnings, it has grown to large proportions. In 1876, the total domestic exports from the United States were:—

Live cattle	$1,110,703
Salt beef	3,186,304
Sheep	171,101
(No fresh beef.)	$4,368,108

These figures include the total exports to all countries from the United States.

In 1877, the reports of live cattle, sheep, fresh beef, and salt beef to Great Britain, were:—

Live cattle	$546,829
Salt beef	1,200,000
Sheep	22,578
Fresh beef	4,552,523
Fresh mutton	36,480
An aggregate of	$6,358,410

To Great Britain alone, as against $4,552,523 to all foreign countries during the previous year; being an increase in the items named of $1,989,382.

In 1878, the United States domestic exports to Great Britain were:—

Live cattle	$2,408,843
Sheep	109,777
Swine	69,395
Hams and bacon	38,241,651
Beef salted	2,118,992
Beef, fresh	4,906,152
Mutton, Fresh	8,272
Lard	10,175,475
Meats preserved	4,284,512
	$62,305,969

Thus, the aggregate exports in meats and cattle, sheep and pigs, to Great Britain alone, in 1878, amounted to nearly as much as the total exports to all foreign countries in 1877, while the total exports in those classes to all foreign countries were to the value of $104,272,552; showing an increase from the previous year of $46,983,794, or more than double the export trade in 1876, which amounted to $49,592,834. I could not obtain the statistics of the trade for the present year, but it has been stated that the exports of live stock this year have reached the value of $11,487,754. It is clear, therefore, that the demand keeps pace with the supply, so that short-horn breeders have good cause to believe that their trade will be prosperous. The exports of live stock for food from Canada, are also very encouraging. In 1878, in cattle, sheep, and swine, they amounted to $1,937,365, and in 1879, to $3,342,006—an increase of $1,404,741.

[Amid these indications of prosperity, we must not conceal from ourselves the fact that great danger threatens the whole trade in live stock. It is beyond doubt that contagious pleuro-pneumonia exists among the cattle of several States of the Union. At this date, it is unnecessary to inquire into the truth of the statements as to the existence of the disease among the cattle composing the cargo of the "Ontario," and which led to the scheduling of American cattle. There is grave reason to doubt the correctness of the conclusions arrived at by the veterinary examiners of the Privy Council. We have high authority for stating this. Professor Williams has, in very plain terms, denied that they were correct; and it will not do to impugn the professional status of Professor Williams, in order to get rid of his statements. He is well known to be one of the first veterinary pathologists of the day; and the best proof of this is, that on the 27th of May last, at a special meeting of the Council of the Royal College of Veterinary Surgeons of Great Britain, he was elected President of that body, by a vote of more than two to one over his competitor, who had been one of the examiners on behalf of the Privy Council, of the cattle brought by the "Ontario," and who had given a different opinion from that of Professor Williams. But, as has been stated, we know that contagious pleuro-pneumonia does exist among cattle in some Eastern States, and the imperative duty of every American breeder and professional man is to urge, with determination which cannot be misunderstood, that the Government of the United States shall take such action as shall effectually "stamp out" this dire scourge, and prevent its reintroduction among the cattle of America. Had the Government heeded the warnings given when we were threatened with an invasion of rinderpest, much of the difficulty would have been avoided, and a proper system of quarantine and veterinary inspection would have been instituted. This Association, at its last meeting, at Lexington, two years ago, sent a memorial to the Government on this subject, to which little attention was paid. Last spring, when the existence of the disease was ascertained, the officers of the Association sent a memorial to the Government, urging the appointment of an international veterinary commission for the purpose of ascertaining where the disease existed, and for advising measures for its suppression, and, until that should be accomplished, for preventing its spread. The result was, that nothing was done, no commission was appointed, and Congress was allowed to adjourn without an appropriation being made for the purpose of getting rid of this terrible disease. Shall the interests of the agricultural portion of this country be unheeded, and shall no adequate measures be taken to protect them?

There is no public question at this moment of greater importance to the people of this country than the extirpation of contagious pleuro-pneumonia. The legislature of the State of New York, at their last session, made an appropriation of $35,000 towards this object; a rigid system of quarantine has been instituted, and by the able and efficient officers appointed by the State Government much has been done. But no mere State legislation and expenditure will do the work. There must be Congressional legislation and a large appropriation by Congress, or all other merely local efforts will fail. The Order of the Treasury Department, issued on the 10th of July 1879, falls far short of what is necessary. To the quarantine of 90 days there is the exception: "Where State " or municipal laws provide for the quarantine of such cattle; and in such cases col- " lectors will permit them to quarantine them in such manner as the State or municipal " authorities require." The "Order" or law should be made to apply to every State in the Union alike. The matter is national in its character, and the laws or orders relating to it should be national in their character, otherwise there can be no certainty as to the suppression or exclussion of the disease. We have a signal illustration of this in the case of an importation of cattle which arrived in New York during the week before last. I quote from the *Country Gentleman* of October 23rd: "We observe by the papers that the contemplated importation of Channel Islands cattle, by Mr. P. H. Fowler, Watford, England, was landed at New York last week by the steamship Cornwall, *and from thence they were transferred by rail to the Messrs. Herkness & Co.'s Bazaar, Philadelphia.* Although in a healthy condition, they will be subjected to rigorous quarantine regulations, and until released will be in charge of Thomas I. Edge, Secretary of the Board of Agriculture and State Commissioner, and Dr. Bridge, Veterinary Inspector. The stock comprises 38 Jersey cows and calves, and two Guernsey bulls.

Now, mark what follows: "Since the foregoing was in type, Messrs. Herkness and Co., of Philadelphia, send the announcement of the sale of these cattle which appears on our first page, *it will take place* on Thursday morning, November 6th." The advertisement referred to states that the cattle were "*direct from the Channel Islands, viâ Bristol, England, to New York per steamer Cornwall and thence by rail to Philadelphia.*" Could there be a stronger illustration of the utter inefficiency of the "Treasury Order" to prevent the importation and spread of the disease. From anything known to anyone, these cattle may all be diseased. The period for the incubation of the disease may not have expired, and although apparently healthy, they may have contracted it, and thus be the means of carrying contagious pleuro-pneumonia into the very heart of the country; for, be it observed, they came from an infected country, and in passing from New York to Philadelphia they were carried through a country where disease exists. It is pleasing to observe that at a meeting of the United States Veterinary Medical Association, held in New York, on the 16th of September 1879, a committee was appointed to take action in the matter, and "to draw up a set of resolutions to be presented to Congress in relation to the investigation and prevention of contagious diseases of domestic animals." I beg to recommend the appointment of a similar committee by this association.

I have pleasure in stating my belief that the Government of Canada will co-operate heartily with the Government of the United States in the adoption of measures calculated to prevent the importation of the disease.

The address was listened to with careful attention by his audience, and was received with every evidence of approval.

Upon its conclusion the Hon. L. F. Allen moved that the thanks of the Convention be tendered the President, and that the address, pending discussion, be laid on the table.

Carried

Judge Jones stated that the President had touched upon a subject of more than ordinary importance. He alluded to the matter of contagious pleuro-pneumonia. He had drawn up a Bill last year, looking to the appointment of a Commission by Congress, to investigate the subject of sanitary regulations, and providing for an appropriation for the expenses of such a committee. He took his Bill on to Washington and placed it in the hands of his Congressman, who presented the same to the House of Representatives. But it was hurried out of sight. At the short session the Bill was not reached, and it finally perished in the extra session for want of log-rolling and lobbying. The trouble is, our members of Congress do not read the agricultural papers; they do not know what pleuro-pneumonia is. State legislation on the subject is insufficient; there must be Congressional action, and the short-horn breeders of America should bring their influence to bear upon the General Government to effect that rseult.

President Christie here suggested that the Convention should appoint a special committee to press this matter upon Congress.

Judge Jones thought it a good idea; but where would the funds to do the "log-rolling" come from? The great difficulty is the want of knowledge on the part of members of Congress. If they understood the matter, it would not be necessary for us to be discussing it here to-day.

President Christie then read from the proceedings of the American Veterinary Association, showing that Dr. Liautard had then moved that a special committee from that organization be appointed to petition Congress concerning veterinary regulations. This had been carried, and Mr. Christie thought that this association should supplement the action of the Veterinary Association by the appointment of a similar committee.

Mr. Allen inquired: Who knows anything about the American Veterinary Association.

Dr. McEachran explained that it was an organization of the Veterinary Surgeons of America; and added that if the Short-horn Association would appoint such a committee as had been suggested, it would be a material aid and reinforcement to the veterinary committee. He had understood that this subject would come up here, and he had attended the Convention in order to throw what light he could upon the matter. He had been employed by the Canadian Government to investigate the sanitary condition of cattle in the Eastern States, and so could appreciate the importance of action on the subject. It was of the utmost importance that the breeders of America should be aroused to the magnitude of the question which is now being presented to them. The neglect and delay by the Government and people of England to recognise the enormity of ravages by contagious diseases was the beginning of the downfall of English agriculture; and to this folly he attributed a great share of the distress now prevailing in England. Pleuro-pneumonia has a long period of incubation, say two or three months; and hence we see that in cattle shipped to Australia, altough the voyage takes from 60 to 90 days, the disease does not break out in some cases for several weeks after landing. There are many different ways in which the disease may be transmitted other than by direct contact; the clothes of attendants, the pens where diseased animals have been confined, their bedding, etc.; and wherever infected animals have been killed, the slaughter-houses should be destroyed. White-washing, as is the usual custom, will not suffice. If Pennsylvania tries to stamp out the plague, it is futile and barren of results unless the neighbouring States co-operate. Great care must be taken in drawing up the proposed memorial to Congress; it must not be done hastily; a clear statement of all the facts must be made, and the General Government must appropriate a large and sufficient sum.

Mr. Allen didn't know much about the matter at present. When the Texas fever raged, some years ago, he served on a committee appointed by the State of New York to control the passage of infected cattle though the State, and by having them slaughtered at Buffalo, and other points, they succeeded in protecting the State. This association began in 1872, with some 120 or 130 members; now he saw 25 or 30 present. More interest must be shown. He reproached the breeders of Illinois for not turning out to the Convention. We may pass resolutions, but how are we to defray the expenses of a Committee at Washington? It is such a hard job to get Congress interested in this subject, that he had grave doubts as to whether the Association could do anything or not.

Mr. Clinton Babbitt said, "popular sentiment" was a thing to be made. We must press this thing upon the people, and we will effect the desired result. This is no mere sectional question, but one in which the people of the whole country is deeply interested. We should appoint a committee whose business it should be to bring the subject squarely before the country, and with the influence of such men as Judge Jones and Hon. David Christie we can and will make ourselves heard. Congress cannot resist popular sentiment when it is once aroused.

Colonel Scott thought this question had a magnitude far beyond mere short-horn interests. It directly affected the whole agricultural interest, and was of vital importance to the millions of people, in our own and foreign countries, who are depending upon us for beef. We stand here in the character of philanthropists. There may be difficulties in the way, but they are not insurmountable. It is a most fortunate feature of this great scourge that it begins to poison the stream at its mouth. It has not reached the source, and it behoves us to see that it does not reach the source. We must grapple with the plague and act promptly and energetically. I am unwilling to sit here and hear it said that we can do nothing. I should feel ashamed if the Iowa men in this Convention could not control the votes of their 11 members of Congress! [Applause.] Kentucky will not stop on any mere petty State rights. My friend Babbitt assures me Wisconsin will be on the right side, and so it will be with all the States. If, as Mr. Allen asserts, this Convention is small in numbers, as compared with the earlier ones, I would say that the association has undergone a winnowing process. We have lost the chaff, and the grain is here. [Applause.] This question belongs to us as men, not as short-horn breeders, and I trust this association will take hold of it and meet it squarely. I do not say short-horn men have no interest in this matter, but it is not confined to them alone; we must throw ourselves into this business in the great cause of common humanity.

Mr. Allen explained that he had not intended to discourage this movement, but he questioned the ways and means to be used. His Congressman was a patent-medicine man, and he did not believe any amount of talking would arouse him to a sense of his duty in this matter, and he did not believe that Colonel Scott and his colleagues could influence the eleven Iowa votes.

Judge Jones said: We must not overlook, of course, the difficulties to be encountered, but Mr. Allen lacks faith. From his zeal he should say that Colonel Scott was a Methodist. (Laughter.) This question does affect all the agriculturists of America; and as this Association is the only representative of the farming interest of the nation, its action would have its influence. I am most heartily in favour of appointing a committee of, say five members, to memorialise Congress on this subject.

Mr. Coombs stated that, as far as Senator Beck of Kentucky was concerned, he knew that that gentleman appreciated the importance of the question, and was willing to do all in his power towards aiding national legislation on the subject.

Judge Jones moved that the Chair appoint a committee of five to press the matter before Congress.

Messrs. Babbitt, Parsons, and Christie favoured appointing one member from each State to urge the matter upon the several State Legislatures.

Judge Jones also favoured legislative memorials; but he thought such a large committee would prove rather unwieldy, and that five men could press the subject with greater facility than a larger number could.

Motion carried.

President Christie then announced the following as the members of the Committee: Hon. T. C. Jones, Ohio; Hon. Emory Cobb, Illinois; Mr. Claude Matthews, Indiana; Hon. T. J. Megibben, Kentucky; and Hon. L. S. Coffin, of Iowa.

Upon motion the name of Hon. David Christie was added.

Judge Jones moved that the election of officers be made the special order for the afternoon session.

Carried.

Mr. Claude Matthews, the treasurer, then read his regular report, which showed a balance of $37 24 in the treasury. He also moved that the membership fee be fixed at $2.

Carried.

Some suggestions were made regarding the publication of the proceedings of the Lexington Convention, and the current session, but no formal action was taken.

Mr. Allen moved that State Agricultural Societies be requested to memorialise the Legislatures of the States to petition Congress on the subject of sanitary regulations concerning live stock.

Carried.

On motion, adjourned to 3 p.m.

Afternoon Session.

The first thing in order being the election of officers, Dr. Sprague moved that Hon. T. J. Megibben, of Kentucky, be elected President, which motion was unanimously adopted. For vice-Presidents, Colonel John Scott, of Iowa, and Hon. M. H. Cochrane, of Canada, were chosen. For secretary, S. F. Lockridge, Greencastle, Indiana. For treasurer, Claude Matthews, of Clinton, Indiana. For directors, J. R. Page, of New York; Leslie Coombs, junior, of Kentucky; T. C. Jones, of Ohio; David Christie, of Ontario; Clinton Babbitt, of Wisconsin; H. Winslow, of Illinois; Pliny Nichols, of Iowa; S. C. Duncan, of Missouri; T. C. Hammond, of Indiana; C. W. Howell, of California; D. W. Crane, of Kansas; M. S. Cockrell, of Tennessee; J. C. Sanborn, of Michigan; T. L. McKean, of Pennsylvania; N. Gates, of Connecticut; A. W. Moore, of Texas; C. Parsons, junior, of Massachusetts; F. W. Russell, of Rhode Island; Le Grande B. Cannon, of Vermont; J. B. Dodge, of New Hampshire; J. G. Cowan, of Virginia; C. A. De Graff, of Minnesota; Charles Shaw, of Maine; John Westfaldt, of North Carolina; J. C. Tremble, of Colorado; J. C. McBride, of Nebraska; W. C. Blinn, of Washington Territory; S. G. Reed, of Oregon; J. M. Browning, of Quebec; H. J. Thornstadt, of Dakotah; H. W. Brewer, of South Carolina; M. B. Helyard, of Mississippi; W. D. Wing, of Montana; and R. H. Allen, of New Jersey.

Judge Jones moved that the next Convention be held at La Fayette, Indiana. Carried.

President Christie then read the following communication from Professor Law, of Cornell University:—

Hon. D. Christie.

Dear Sir, Cornell University, Ithaca, N.W., October 4, 1879.

My constant absence from home must be my excuse for this late response. I had hoped to have sent you an illustrated article of 100 pages on the "Contagious Pleuro-Pneumonia," now in press, but it will be issued too late for your meeting. It will be mailed as soon as issued. At present I have only time to say that the "lung-plague" has been extinguished in Richmond, Suffolk, and Orange counties in this State. It is almost extirpated from New York, Westchester, and Putnam counties, and now only prevails to any extent in King's county. We have been compelled to delay effective measures, and this last by lack of means, and are now only waiting for further supplies to crush the pestilence in every part of the State. As New York and Brooklyn (King's county) were about equally infested last February, it may interest the meeting to know what measures have been so effective in the former—and the more so that it illustrates how the most stringent measures are by far the best and most economical.

"1st. We got new yards, to which only healthy cattle, from districts known to be sound, were admitted. All stock from infected counties or States, or that had been in cars, yards, or boats open to stock from such States, were rigidly excluded.

"2nd. No animal was allowed to leave the new yards until sold, and then only after examination, and with permit, stating destination, route, and time allowed.

"3rd. Cattle going to any stable in the city, dealer, or milkman, could not leave such stable again, except to an abattoir, for immediate slaughter, and with a permit. We thus abolished dealers' stables, which were simply pest-houses, and stopped the baleful system of peddling cattle from stable to stable, which came to be simply a peddling of disease.

"4th. Dealers were placed on their good behaviour, by our withholding permits from all that broke our rules.

"5th. The co-operation of the police was secured to stop moving of cattle without license, and to impound the same.

"6th. An inspector went every night to the offal dock, where all carcasses are sent, and opened all cattle found there, and traced to their street and number any showing the lesions of the plague.

"Besides these particular measures we had the general rules enforced elsewhere, including systematic inspection of herds, the abolition of pasturage on highways and open lots; of the herding of the stock of different owners together or successively on the same lots; the granting of butter licenses to healthy herds only; for reporting sickness, inspection, condemnation, appraisement, slaughter, indemnity, disinfection, quarantine of infected herds, registration of the same by personal marks, and disposal of fodder, litter, manure, &c.

"The system has been fully enforced in New York for three montht only, and the city and county is now all but sound, whereas, in Brooklyn, where local obstruction hindered its application, the disease still prevails widely.

"I regret that I cannot possibly visit Chicago at present, though it would give me much pleasure to meet with the 'Association of Short-horn Breeders.' I am at present alternating between 'Cornell' and New York, and have not a spare moment at either place.

"Yours very faithfully,
"JAMES LAW."

Dr. McEachran then gave a short sketch of the history of contagious pleuro-pneumonia in America, describing the result of his recent investigations in the service of the Dominion Government, and dilating upon the apathy shown by the United States authorities in the premises.

Upon the conclusion of his remarks, Judge Jones rapped the doctor across the knuckles for having made a hasty and ill-timed report to the Canadian Government, which had done the United States a great injury in affecting our live-stock export trade.

Dr. McEachran explained that all that he was required to do was to see if the disease existed in the States; and after he had personally examined various sections and witnessed thousands of infected animals, he made his report to that effect. Was there anything hasty in that? And further, his report was not the cause of the scheduling of the United States cattle in English ports. The Privy Council received their information from an entirely different source.

President Christie came to the doctor's rescue, and gave the United States authorities a merciless scoring, denouncing them in unmeasured terms; charging Secretary Sherman and others with criminal negligence in trifling with such a vital question.

This aroused the patriotism of the honourable gentleman from Delaware, and throwing himself into the breach with flashing eyes, he informed the gentlemen from the Queen's dominions that when they came here to tell us of our misfortunes they should be a little more careful in their statements.

He insisted that it was unjust that simply because a narrow belt of country on the Atlantic slope was infected with this disease, the great West should have to suffer scheduling at the hands of the British Government; intimating that the gentlemen from Canada had helped to bring this about. He thought much more could be accomplished by approaching our Government with kind words, than by making bitter attacks upon those in power.

Dr. McEachran denied the allegation, and stated that they had asserted all along that the West was free from the plague; but the Privy Council recognised no geographical divisions of the United States. The mere fact that pleuro-pneumonia existed in this country was sufficient reason for them to schedule the nation at large.

Mr. Coffin said that since the plague exists along our sea-board, it is a wonder that any of our cattle reach England in a healthy condition. And it is the purest good luck that the disease has not been carried West.

At this point Dr. N. H. Paaren was called for and made a few well-pointed remarks upon the duty of the Government in treating the subject; also avowing that the West was absolutely free from the scourge.

After various other informal observations by Messrs. Parsons, Hayward, Sanders, and others, Mr. Coffin moved that the Director in each State be requested to urge his State Legislature to petition Congress.]

Carried.

On motion, adjourned until 7.30 p.m.

EVENING SESSION.

Mr. G. Sprague, of Iowa, read a paper on Feeding Cattle, which was attentively listened to, and which will appear in our next issue. After the reading of Dr. Sprague's paper, the Convention adjourned to meet at Lafayette, Ind., the last Wednesday of October 1880.

No. 30.

LETTER from the BRITISH CONSUL-GENERAL at NEW YORK to the MARQUIS OF SALISBURY.

No. 51. British Consulate-General, New York,
December 2, 1879.

MY LORD,

I HAVE the honour to report to your Lordship that contagious pleuro-pneumonia among cattle still exists in this city and in Putnam county in this State; also in New

Jersey, as before reported by me. The number of animals affected is, however, not so large as heretofore, the result being doubtless due to the continued efforts of the State authorities to extirpate the disease.

I have, &c.
(Signed) E. M. ARCHIBALD.

Her Majesty's
Principal Secretary of State
For Foreign Affairs, London.

No. 31.

LETTER from the ACTING CONSUL-GENERAL at PHILADELPHIA to the MARQUIS OF SALISBURY.

British Consulate, Philadelphia,
December 9, 1879.

My Lord,

I have the honour to report to your Lordship that a few cases of pleuro-pneumonia among cattle continue to exist in the State of Pennsylvania, notwithstanding the exertions of the State authorities to eradicate the disease. In the county of Philadelphia, among the dairy herds, a few new cases have been discovered, and repressive measures will at once be resorted to.

The Commissioner appointed by the Governor of the State about six months ago has, up to the date of my last report, placed in quarantine twenty-seven herds containing four hundred and eight head of cattle, which were found liable to infection. Of these herds eight have since been released from quarantine and pronounced safe from another outbreak, except by infection from outside cattle.

As soon as the Commissioner learns of the existence of the disease in any district the herd in which a case occurs is inspected by a veterinary surgeon, employed by the State, and the herd at once placed under quarantine, and the diseased animals, after appraisement, are killed.

The history of the infected herds above referred to is as follows:

No. 1. (in York county). Infected by steers bought in Baltimore. Six head were either lost by death previous to quarantine or were killed for the purpose of checking the disease.

No. 2. Contained 20 cows, two bulls, and 10 calves. The herd was quarantined June 12th. Four head died previous to the quarantine, and whilst in quarantine 14 head were killed.

All the animals except one were affected, and a number of them are now useless to the owner. It is apparent in this case that the owner conveyed the disease to his herd after assisting in the care of an adjoining infected dairy.

No. 3. (Delaware county.) The herd contained fifty head, a number of which died previous to being placed in quarantine. In this case the disease was supposed to have been introduced by the purchase of cattle. Eleven head were killed by the State Commissioner.

Nos. 4, 5, and 5½ were herds adjacent to each other, and the farms were traversed by a small stream of water, at the head of which the disease would appear to have orginated, an animal dying in the stream and was buried close to its banks. In No. 4 one animal died and one was killed, and No. 5 the first animal attacked was promptly killed. Isolation was immediately adopted; No. 5½ is still infected. No. 6 having 11 head was quarantined. No. 7 (Lancaster County) had 42 head, and when discovered was infected throughout by two afflicted animals running with the herd. Seven animals were killed in one day, and never placed in quarantine. Subsequently eight more were killed, and the disease effectually eradicated. The infection was taken from an adjoining herd, which, in its turn, was infected by stock from New York.

No. 8. This herd is supposed to have been infected by the owner of No. 2 administering medicine to the animals after attending to his own. Seven animals were lost in this herd and the rest are not yet out of danger.

No. 9. A herd of 31 animals. In this case the disease was checked by the prompt killing of one animal and the immediate isolation of the others. The herd has been released from quarantine.

Nos. 10, 11, and 12. Small herds, in two of which every animal exhibited symptoms of disease, but by prompt measures and the sacrifice of a few head, the contagion was checked.

Nos. 13 to 20 inclusive are recent cases, and the herds have suffered little loss in consequence of the measures immediately adopted.

No. 21. This herd was infected by six cows purchased in the Philadelphia market, the disease showing itself within 10 days after the purchase. Of the six cows five have died or been sacrificed. The cows came from the Philadelphia drove yard, but beyond that place the origin of the infected animals could not be traced.

No. 22 (Montgomery County). This herd was infected by a cow purchased from a drover. When purchased she was coughing, and when examined by the official surgeon, one week subsequently, was so far gone that the owner consented to have her killed as worthless, exacting no compensation.

No. 23. This herd was infected by contact with herd No. 16 previous to its being placed in quarantine. The animals are still under treatment. Sulphur fumes appear to have been effectual in preventing a spread of the disease. All the animals were more or less affected.

No. 24. Containing 30 head, caught the disease from No. 7, as, by accident they got into the inclosure which had previously contained the former herd for a short time.

No. 25. This herd was allowed to graze alongside of No. 7 with no separation other than that afforded by a stream and an open fence. Before the disease was reported to the State Commissioner most of the steers had been sent to market.

All the stock brought into the State of Pennsylvania from Europe is under the control of the State Agent or Commissioner, and the animals are placed in quarantine after inspection by an official veterinary surgeon. After the quarantine they are again inspected and, if found healthy, a certificate is granted permitting their removal to any part of the State. The incoming animals are thus subjected to rigid examinations; first, at the European port of shipment; second, on arrival; and, third, on the termination of their quarantine. In these exactions the interests of the importers are duly considered when they do not in any way conflict with the general interests of the commonwealth.

As far as it has been in my power to learn, there would appear to be no pleuro-pneumonia or other contagious diseases among cattle in the western states of this consular district. It is to be remembered, however, that in the shipments to England from Philadelphia, eastern cattle may be occasionally included, as at the stock-yards the animals are gathered in from all quarters, and the labours of the State Commissioner, detailed in this despatch, show the continued existence of pleuro-pneumonia in various counties of Pennsylvania. It is not improbable that the present Congress of the United States will be called upon to pass a cattle disease Act for the repression of all contagious diseases throughout the country, as the stock raisers are now alive to the incalculable losses that must ensue should pleuro-pneumonia extend to the Western States. Uniformity of regulations throughout the country is absolutely necessary for the aid of those who labour for the repression and the extinction of contagious diseases among cattle. Doubtless strong opposition will arise from the dealer and the skipper, whose interests will not be enhanced by legislative enactment, and they may prove no inconsiderable obstacles to the passage of such a law.

It is apparent, however, that the only safe course to be pursued at home is the continuation of the present order for the slaughter of all cattle for food at the port of debarcation.

I have, &c.
(Signed) George Crump.

The Right Honourable
The Marquis of Salisbury, K.G.
&c. &c. &c.

No. 32.

LETTER from the BRITISH CONSUL-GENERAL at NEW YORK to the MARQUIS OF SALISBURY.

(No. 6.)
British Consulate General, New York,
January 5, 1880.

My Lord,

I have the honour to report to your Lordship that since the date of my last report pleuro-pneumonia has made its appearance among some herds of cattle in the county of West Chester in this State, and still prevails there.

As regards other parts of my consular district, I have nothing to add to my last report to your Lordship.

I have, &c.
(Signed) E. M. ARCHIBALD.

Her Majesty's Secretary of State
for Foreign Affairs.

No. 33.

LETTER from the ACTING BRITISH CONSUL at PHILADELPHIA to the MARQUIS OF SALISBURY.

(Sanitary, No. 1.)
British Consulate, Philadelphia,
January 20, 1880.

My Lord,

I have the honour to report to your Lordship that since my Despatch No. 26 of December 9th, relating to contagious diseases among cattle in this consular district, two fresh outbreaks of pleuro-pneumonia have occurred in the State of Pennsylvania. One in Lehigh county, in a herd of 30 head introduced by a cow purchased in the city of Baltimore, State of Maryland. Ten head were killed at once, and several others since. The contagion spread to adjoining farms by the cattle intermingling before the disease was discovered. The other occurred a fortnight ago in Montgomery County adjoining the city of Philadelphia in a herd of 30 head; four cattle were lost, two having died and two were killed. Eight weeks since a few head of cattle were purchased in the Philadelphia market for this farm, and it is believed the disease was introduced by them.

In the lower section of the city of Philadelphia, where the disease broke out as reported in my Despatch No. 26, it was effectually cured by the prompt killing of all the infected animals.

Pleuro-pneumonia is daily awakening increased attention among stock raisers and dairymen throughout the country. The demand for a national intervention in lieu of State or local regulations for the extirpation of the disease is growing, and the prompt attention of the Congress of the United States is called for. It is necessary to engraft a public confidence in sanitary measures before a complete extinction of the disease in this country can be expected. The following reasons are put forth by the skilled in cattle diseases why the National Government should take the matter in hand:—

1. The disease is an exotic, and if once suppressed would never reappear unless reimported.
2. The plague is slowly extending to the western and southern parts of the United States, and if neglected must lay the entire continent under contribution.
3. If the plague once reaches the unfenced cattle ranges of the South and West it would be impossible to eradicate it.
4. The State wealth of many of the Western States is largely made up of live stock, and the spread of the contagion to those States would be a national calamity.
5. The disease is more violent and fatal in warm climates than in cold. The relative mortality therefore in the Gulf States and in the Mississippi Valley would be greater than in the eastern sections of the country.
6. The infection of the Southern and Western States would inevitably spread the disease over the whole of the Middle and Eastern States, as the Western and South-Western States are the source of the cattle traffic, and the shipments are made in railway cars, which, once infected, would become active *media* of the poison.
7. As the seeds of this disease remain latent in the system for a period varying from ten days to three and a half months, and only become manifest by their effects at the end of this time, infected cattle may be carried from ocean to ocean or from the lakes to the gulf, and remain there often for weeks in apparent health, and yet spread pestilence and destruction in the end.
8. If to avoid this danger it is proposed to quarantine all cattle passing from State to State, safety would require a quarantine of at least three months. Suppose a quarantine of this kind were to be attempted at Buffalo, New York, the regular daily shipment is five trains of 30 cars each, representing 3,000 head of cattle. Detain these for 90 days there would be accumulated 270,000 head of cattle. Any such system would speedily break down by its own unwieldiness. This estimate is far beneath the real numbers, and the number of cattle trains passing east is frequently double or treble that quoted.
9. Chronic cases of lung plague, in which a large mass of lung has become encysted, may carry this for months or even a year before all can be liquified and absorbed, and at any time during this period such cases may become actively infective by the escape of materials from this pent up virulent mass. Against this no quarantine on a large scale can guard; and as even a careful professional examination will not in all cases suffice to reveal the presence of the smaller masses, infection by animals in this condition becomes inevitable wherever a large traffic is carried on.
10. No State can be rendered secure unless all the States are cleared of the contagion.
11. Smuggling of diseased cattle from one State to another can only be prevented by a national executive sanitary administration applying to all the States in the Union.

12. With different authorities in adjacent States it becomes difficult or impossible to trace infected stock smuggled from State to State; and if the second State has no sanitary administration the smuggled animals may be distributed at will and the area of infection indefinitely extended.

13. With different authorities in different States, and with different systems and measures, mistakes and losses will accrue to both State and purchaser which would be altogether obviated if the system and control were one.

14. Uniform action by one authority in all the States would remove the source of much irritation among dealers who have now to inform themselves as to the restrictions imposed in the different States.

15. It has been decided by the Supreme Court of Illinois that any State forbidding the introduction of cattle from a neighbouring State, on the ground of suspected infection, is unconstitutional. It would, therefore, appear that no State has the power to exclude the infected cattle of a neighbouring State, but must wait for their entry and kill or quarantine them on its own soil. This would require an impracticable system of quarantine, and it devolves upon the United States to give the necessary protection on the principle of controlling and regulating inter-state commerce.

16. Three of the States now infected have shown no tendency to act for the extinction of the disease, and unless the United States pass a general law for its suppression it cannot be eradicated from the country.

The subject can hardly be exaggerated in its importance, and action by the Congress of the United States should not be delayed in any attempt to pass a general law applicable to the entire country for the suppression of infectious and contagious diseases in the United States.

No. 1. The State of Ohio, one of the western states of this consular district, has had a statute on the subject since 1867, and measures are now about to be taken with a view to its rigid enforcement, I have the honour to enclose your Lordship a copy of this Act marked No. 1.

No. 2. The Philadelphia Society for the Promotion of Agriculture and the Academy of Natural Sciences have taken an interest in the question of the suppression of cattle diseases, and I have the honour to enclose your Lordship a copy of the proceedings at those institutions within the past few days, marked No. 2.

No. 3. The quarterly report of the Pennsylvania Board of Agriculture for the quarter ending December 31, 1879, contains the report of the special agent of the governor of the State on contagious pleuro-pneumonia and an interesting report by the veterinary surgeon of the board, two copies of which I have the honour to enclose your Lordship, marked No. 3.

I have, &c.
(Signed) George Crump.

The Right Honourable
The Marquis of Salisbury, K.G.
&c. &c. &c.

Enclosure 1 in No. 33.

STATUTE OF THE STATE OF OHIO, 1867.

Section 1. Be it enacted by the General Assembly of the State of Ohio, that it shall be unlawful for any person to sell, barter, or dispose of, or to permit to run at large, any horse, cattle, sheep, or domestic animals, which are infected with contagious or infectious disease, or have been recently exposed thereto, unless he shall first duly inform the person to whom he may sell, barter, or dispose of such horse, cattle, sheep, or other domestic animal of the same; and any person so offending shall, on conviction thereof, before any court having competent jurisdiction, be fined of any sum not less than $20 or more than $200, with costs of prosecution, or be confined in the jail of the county for not more than 30 days at the discretion of the court.

Section 2. That any person being the owner or having the charge of any horse, cattle, sheep, or other kind of stock, knowing the same to be infected with contagious or infectious disease, shall knowingly permit it to come in contact with any other persons horses or stock, without such persons knowledge or permission, shall be fined in any sum not less than $50, nor more than $500, with costs of prosecution, or be confined in the jail of the county for not less than 10 nor more than 50 days, at the discretion of the court.

Enclosure 2 in No. 33.

PROCEEDINGS of the PHILADELPHIA SOCIETY for the PROMOTION of AGRICULTURE and the ACADEMY OF NATURAL SCIENCES.—The "LUNG PLAGUE," its RAVAGES among the CATTLE, SOUTH and WEST.—The PHILADELPHIA SOCIETY to petition the GENERAL GOVERNMENT to take such ACTION as will PREVENT the TRANSPORTATION of CATTLE from INFECTED DISTRICTS.

At the annual meeting of the Philadelphia Society for the Promotion of Agriculture, held yesterday morning at the rooms of the society, Dr. Charles R. King presiding, Dr. J. W. Gadsden presented the sixth quarterly report of the Pennsylvania Board of Agriculture. He referred to pleuro-pneumonia, and stated that Mr. James Law, professor of veterinary medicine in Cornell University, had traced the disease from place to place to infected herds.

Professor Law asserts the disease is slowly spreading southward west from Alexandria, and it will be as impossible to eradicate it as from the Steppes of Russia. It would be appropriate for the agriculturists of the different States of the South and West to petition Congress to take this matter up and adopt such measures as would for ever rid our country of this most insiduous of all animal plagues. At all hazards this work ought to be done, and that speedily. It is folly, and worse, to quarrel about the means until the plague shall have passed beyond control. Action is wanted of a prompt and decisive nature by the general government or with its assistance, and those who are most deeply interested in the subject should press this upon the government until such action shall have been secured.

Dr. Gadsden requested the Agricultural Society to petition Congress through the Commissioner of Agriculture, Hon. William G. LeDuc, to adopt such measures as would rid this country of the contagious disease in cattle, known as "the lung plague," or pleuro-pneumonia.

Dr. Gadsden referred to a recent case in Lehigh County, where a herd of 30 was infected by a cow brought from Baltimore, and another case of a similar nature, within the past week, at Elm Station, on the Pennsylvania railroad. He stated there had never been a case in this country except as the result of contagion. Massachusetts stamped it out, and has not known it since 1865.

Professor Booth was confirmed in his views that the disease can be stamped out and should be. A petition to Congress on the subject could do no harm, and might result in good.

Mr. Blight suggested the passage of a resolution on the subject, and forwarding a copy of the same to Mr. Le Duc.

Mr. Burnett Landreth offered the following, which was adopted:

Whereas it is patent that the ravages of the "lung plague," or pleuro-pneumonia, can only be arrested by heroic measures, be it

Resolved, by the Philadelphia Society for the Promotion of Agriculture, that the General Government be urgently requested to take such action as will prevent the transport of cattle from infected districts in the seaboard states to the interior, which will certainly be infected unless decisive action be taken by the United States Board of Health or other proper department.

Mr. Peter B. Long presented, through Mr. George Blight, to the Society a copy of the "Freeman's Journal and Philadelphia Mercantile Advertiser," of July 3, 1822, containing an account of the exhibition of the Society, held in June of that year.

An election for officers of the society to serve the ensuing year was held, with the following result:

President.—Dr. Charles R. King.

Vice-President.—Burnett Landreth and W. Heyward Drayton.

Treasurer.—George Blight.

Recording Secretary.—Archibald R. Montgomery.

Assistant Recording Secretary.—J. E. De La Motta.

Chemist.—Professor J. B. Booth.

Librarian.—Archibald R. Montgomery.

Library Committee.—David Landreth, Archibald R. Montgomery, George Blight.

Executive Committee.—The President, Secretary, and Treasurer, also Burnett Landreth, John S. Haines, Dr. Alfred Elwyn, Dr. A. L. Kennedy, Frank A. Comly, and Joseph E. Gillingham.

ACADEMY OF NATURAL SCIENCES.—PLEURO-PNEUMONIA not caused by the PRESENCE of PARASITIC WORMS—A BLIND CAVE INSECT.

At the last meeting of the Biological and Microscopical section of the Academy, Dr. Turnbull read a paper on the peculiar round-worm or strongylus infesting the air-passages, of calves, which Dr. McCoart had recently been reported in the daily papers to have assigned as the cause of the supposed contagious disease of cattle, known as pleuro-pneumonia.

Dr. Turnbull gave a very full and satisfactory account of the parasite, tracing its life history through its various phases, some of which were supposed by eminent authorities to be passed in the intestine of the common earth-worm. From this intermediate host they were supposed to find their way to the grass and herbages eaten by the cattle, and thus be taken into their mouths, stomachs, and air-passages, causing a great amount of irritation, and consequent expectoration when they have attained their adult state, and giving rise to the disease known as parasite bronchitis, husk, or hoose.

It most frequently affects animals pasturing in low, wet, grounds ; the relation between the parasite and abundance of earth-worms and its allies being evident.

Dr. Gadsden being introduced, said he was not a little surprised to read, in a report of the proceedings of the last meeting of the section, that these parasites were the cause of the disease known as pleuro-pneumonia. He thought it had been demonstrated, beyond all possibility of doubt, by some of the most distinguished veterinarians, that the disease was specific and malignant, and was spread by the infection of healthy animals, through the medium of a specific virus derived from diseased ones. Many authorities were cited by the speaker, besides cases of his own in this country and England, to prove that such was the case. If this is not the case then it is certainly to be considered a great waste of money by the State and General Governments to have appointed inspectors and established a system of quarantine over herds of cattle known to be affected, in order to prevent the spread of the disease. Not only does the anti-contagious doctrine reflect upon the wisdom of the policy of the State and General Governments, but also upon a large and intelligent class of veterinarians, such as Professors Law and Gamgee. The fact of the existence of the disease in this State, which the authorities are trying in every way to stamp out by the means already referred to, with every hope of success, interferes greatly with our export trade in live meat with England, whose House of Commons recently prohibited the importation of American cattle, which on the authority of one of our Government reports, were said to be diseased.

Dr. McCoart being present, stated that he was very sorry indeed to have been misunderstood, and said that he did not mean to imply that the filariæ were the causes of pleuro-pleumonia, as he had been reported to have said. What he meant to convey was that parasitic bronchitis or hoose no doubt was often mistaken by amateurs for real pleuro-pneumonia. In reply to a question by Dr. Gadsden, Dr. McCoart replied that he did not consider that it had been proved that the disease was contagious.

Dr. Gadsden left some specimens of the diseased and healthy lungs of cattle for microscopic examination by the members. It was remarkable that in pleuro-pneumonia but one lung was affected, the one on the other side remaining healthy. The diseased one is filled up almost to solidity with lymph, and weighs as much as fifty, whilst a healthy one weighs but three and a half pounds.

After further discussion by Drs. Seller, Turnbull, Messrs. Potts, Perot and others, the discussion was closed, the Chair considering it inexpedient to continue the committee appointed at a previous meeting.

Mr. Ryder briefly described a new scale insect, or spring-tail, from a cave in Oregon, where it had been found last summer by Professor Cope. The creature belonged to a genus common in our park, under stones, in moss, etc., known to science as Orchesella. It differed from the species found here mainly in the almost total absence of eyes, these being represented by the faintest black points. The disappearance of eyes was supposed to be due to the prolonged existence of its race in the darkness of the cave for many generations. He proposed to call the new form Orchesella cæca, in reference to its nearly blind condition.

ROUND WORM OR STRONGYLUS.

At the last meeting of the Academy of Natural Sciences, Dr. Turnbull read a paper on the peculiar round worm or strongylus infecting the air passages of calves. It had been reported that Dr. McCoart, of this city, had assigned as the cause of pleuro-pneumonia, the presence of these worms. This was shown to be erroneous. Dr. Turnbull gave a very full and satisfactory account of the parasite, tracing its life history through its various phases, some of which were supposed by emment authorities to be passed in the intestine of the common earth-worm. From this intermediate state they were supposed to find their way to the grass and herbage eaten by the cattle, and thus be taken into the stomachs and air passages, causing a great amount of irritation, and giving rise to the disease known as parasitic brohchitis, husk, or hoose. It most frequently affects animals pasturing in low wet grounds, the relation between the parasite and its allies being evident.

Dr. Gadsden said he was not a little surprised to read, in a report of the proceedings of the last meeting, that these parasites were the cause of the disease known as pleuro-pneumonia. He thought it had been practically demonstrated beyond all possibility of a doubt by some of the most distinguised veterinarians, that the disease was specific and malignant, and was spread by the infection of healthy animals, through the medium of a specific virus derived from diseased ones. If this is not the case, then it is certainly to be considered a great waste of money by the State and General Government, to have appointed inspectors and established a system of quarantine over herds of cattle known to be affected, in order to prevent the spread of the disease. The fact of the existence of the disease in Pennsylvania, which the authorities are trying to stamp out, and with every hope of success, interferes greatly with our export trade in live meat with England, whose House of Commons recently prohibited the importation of American cattle, which on the authority of one of our Government reports were said to be diseased. The doctor exhibited specimens of diseased and healthy lungs. Generally but one lung is affected. It solidifies, presenting a marbled appearance, and is frequently found to weigh forty and even fifty pounds, while a healthy one weighs three and a half pounds.

Enclosure 3 in No. 33.

From the SIXTH QUARTERLY REPORT of the PENNSYLVANIA BOARD of AGRICULTURE for September, October, and November, 1879.

The LUNG PLAGUE (Contagious Pleuro-pneumonia), by the Special Agent of the Governor.

For several years past there has been a growing desire upon the part of the stock breeders and stock owners of the State, that, if possible, something might be done to prevent, or at least mitigate the losses they have each year experienced from the disease known as pleuro-pneumonia. At meetings of our farm clubs and granges, the subject was discussed and committees appointed to take it into consideration and report.

The immense loss which must result from the infection of the large herds of the West and South-west, was plainly pointed out. It was shown that England, with only 6,000,000 animals, had lost more than $500,000,000 by this disease since its introduction from Holland, and that, in the same ratio, the introduction of the disease among our 28,000,000 cattle, would cause a loss of $2,000,000,000 in an equal time. That in our own State, the loss would in a short time, seriously impair an important interest, and would prove eminently more fatal in the West, where all interests are more or less intimately connected with that of stock raising, and where all interests thrive or languish in sympathy with it.

Massachusetts, by prompt and vigorous action, eradicated the disease from her borders, and last year expended less than $50 for this purpose. It is true that the struggle cost her nearly $68,000, but her stock-owners well know that an immunity from the disease was cheaply purchased at this price. The disease had insiduously crept from dairy to dairy, from farm to farm, from one stock-yard to another, until four of the leading dairy counties of the eastern portion of our State were infected. In these counties the entrance of the disease into a herd was considered as tantamount to a loss of from 20 to 50 per cent., and sometimes exceeded even the latter rate. Dairies were broken up, the business abandoned, and, in many cases the surviving animals sold and scattered, thus forming centres of further contagion. All practical men admitted the presence of the disease. Our agricultural papers discussed its spread and its probable results. Our veterinary surgeons had, in a measure, become familiar with it, and most of them recognised the fact that treatment was of but little avail. With the disease a matter of comment in our daily papers, it was not at all surprising that the British Government, whose farmers had lost millions by this and similar imported diseases, and had spent immense sums in attempts to stamp out this very disease, should direct its attention to the presence of the disease here, and the possibility of the infection being conveyed by cattle imported into

English ports. The agents of the British Government, accompanied by competent veterinary surgeons, who were familiar with the disease during its ravages in England, starting from Canada, found it in all the Atlantic States, from Massachusetts to Carolina, and, reporting its presence to the home Government, a quarantine was ordered on all American cattle. They failed to recognise the fact that the cattle thus imported did not come from infected districts, and that they did not come in contact with infected cattle; but, finding *supposed* cases of contagious lung plague (pleuro-pneumonia) in the cargo of the "Ontario," at once issued the edict which practically stopped the importation of live American cattle, at least for a time. It is now rendered very probable, if not almost certain, that the stock in the "Ontario" were only affected with common or sporadic pneumonia, caused by injuries sustained by the vessel during a severe storm, and the consequent drenching with cold sea water, which the cattle afterwards sustained; yet this furnished the needed excuse, and had not this been found, another would have soon taken its place. Whether this action of the British Government was due to a desire to protect British cattle or arose from a fear of competition, rather than contagion, it is not for us to discuss, but such are the facts of the case.

A number of our best veterinary surgeons and most enterprising cattle breeders and dealers had, for a long time, been anxious that our national Government should quarantine *all* imported cattle; and, if possible, by this inexpensive precaution, prevent the introduction among our stock the much-feared rinder-pest, foot-and-mouth disease, or the many other contagious diseases to which the horned stock of Europe are liable; but their advice and request has not met with appreciative action on the part of the general Government, until after the passage of such an act would assume the appearance of retaliation, and, of course, came too late to have any effect upon the disease which we have under consideration.

By legislative action, the State of Massachusetts had, at least four years before, not only admitted the existence of the disease, but had, also, by legislation, decreed an attempt to eradicate it by what has been styled the "Stamping out process;" and, after a few years of active work, the sought-for result has been attained, and the State, except from cases brought in from neighbouring States, has been pronounced clear from the disease. Connecticut, New York, and New Jersey, by similar legislative enactments, had also recognized the disease in an official way, and had made appropriations and passed laws necessary for its attempted eradication, on a plan similar to that adopted by Massachusetts, and had asked the co-operation of Pennsylvania in a common and concerted attempt to accomplish this purpose, and, if possible, prevent the further progress of the disease westward.

At this stage of the proceedings, the worst injury which could be inflicted upon our export trade in live stock had its effect, and the shipments in live cattle had practically stopped on account of quarantine regulations. The farmers of our State were aroused to the imminent danger resulting from the permanent location of the disease in this country. Several States, for mutual help and protection, had joined in an endeavour to stay the pest, and the assistance of our State was asked. Our past losses were estimated at from $500,000 to $750,000, and good judges placed the amount even higher, and it was impossible to estimate the loss, if nothing was done to prevent its further spread.

Legislation and its Results.

Recognizing all these facts, and being in possession of many more which might be enumerated, a meeting of dairymen of Delaware, Montgomery, and adjoining counties held in Philadelphia, early in March, appointed a committee to wait upon the Secretary of the Board of Agriculture, and urge the importance of legislative action. The veterinary surgeon of the Board, with this committee, visited herds supposed to be infected. Veterinary surgeons who had had years of experience with the disease in England, were called in; post-mortem examinations were made, and the existence of the disease established beyond a reasonable doubt.

The Legislature being then in session, the Secretary of the Board of Agriculture laid all the evidence before the joint Committee of Agriculture of both Houses, consisting, on the part of the Senate, of Senators St. Clair, Seamans, Kauffinan, Roberts, Craig, Ross, and Beidelman, and on the part of the House of Representatives, of Messrs. Kincaid, Matlack, Greenawalt, Magill, Ackerly, Miller, Stephens, Hill, McConnel, Landis, Walker, Burton, Eberly, Fullerton, Lowing, Nicholls, Bowman, Hallowell, Schaeffer, Davis, Fabel, Gammel, Newbaker, Eldred, and Morris.

After discussion, this committee decided that it would be proper that the State should adopt a line of precautionary and preventive action not only for the benefit of its own citizens, but also out of respect to the action of adjoining States, and a sub-committee was appointed to consult with the Governor, and if deemed expedient, prepare a draft of an act providing for the desired action. After consultation, the following resolution was offered by Senator Kauffman, and adopted by both branches of the Legislature:

"Whereas, the States of New York and New Jersey, by recently enacted laws to prevent the dissemination among live stock of the disease known as pleuro-pneumonia, now invite this State, by a concert of action, to assist them to eradicate this contagion; therefore,

"Resolved by the Senate (if the House of Representatives concur), that the Governor be and is hereby authorised to take such preliminary action as may be necessary to prevent its further spread."

This resolution was approved by the Governor, March 27, 1879.

At the same time the draft of the Act, as adopted by the committee, was introduced by Senator Kauffmann, and after amendment, passed both branches, and was approved by the Governor, May 1, 1879:

AN ACT to prevent the Spread of Contagious or Infectious Pleuro-pneumonia among the Cattle in this State.

Section 1. Be it enacted, &c., That whenever it shall be brought to the notice of the Governor of this State that the disease known as contagious or infectious pleuro-pneumonia exist among the cattle in any of the counties in this State, it shall be his duty to take measures to promptly suppress the disease and prevent it from spreading.

Section 2. That for such purpose, the Governor shall have power and he is hereby authorised to issue his proclamation, stating that the said infectious or contagious disease exists in any county or counties of the State, and warning all persons to seclude all animals in their possession that are affected with such disease or have been exposed to the infection or contagion thereof, and ordering all persons to take such precautions against the spreading of such disease as the nature thereof may in his judgment render necessary or expedient; to order that any premises, farm, or farms where such disease exists or has existed to be put in quarantine, so that no domestic animal be removed from said places so quarantined, and to prescribe such regulations as he may judge necessary or expedient to prevent infection or contagion being communicated in any way from the places so quarantined; to call upon all sheriffs and deputy-sheriffs to carry out and enforce the provisions of such proclamations, orders, and regulations, and it shall be the duty of all the sheriffs and deputy-sheriffs to obey and observe all orders and instructions which they may receive from the Governor in the premises; to employ such and so many medical and veterinary practitioners and such other persons as he may from time to time deem necessary to assist him in performing his duty as set forth in the first section of this act, and to fix their compensation; to order all or any animals coming into the State to be detained at any place or places for the purpose of inspection and examination; to prescribe regulations for the destruction of animals affected with the said infectious or contagious disease, and for the proper disposition of their hides and carcasses, and of all objects which might convey infection or contagion (provided that no animal shall be destroyed unless first examined by a medical or veterinary practitioner in the employ of the Governor as aforesaid); to prescribe regulations for the disinfection of all premises, buildings, and railway cars, and of objects from and to which infection or contagion may take place or be conveyed; to alter and modify, from time to time as he may deem expedient, the terms of all such proclamations, orders, and regulations, and to cancel or withdraw the same at any time.

Section 4. That all the necessary expenses incurred under the direction or by authority of the Governor in carrying out the provisions of this Act, shall be paid by the treasurer upon the warrant of the auditor general, on being certified as correct by the Governor; provided that, animals coming from a neighbouring State that have passed a veterinary examination in said State, and have been quarantined and discharged, shall not be subject to the provisions of this Act.

During the passage of this Act the existence of the disease in the State had been denied. Hence, immediately after its approval, his Excellency Governor Hoyt appointed a commission to "examine and determine whether infectious or contagious pleuro-pneumonia exists among cattle in any county or counties of this commonwealth, and report the same to the Governor without unnecessary delay." This commission consists of Hon. Samuel Butler and Hon. H. C. Greenawalt, on the part of the Legislature; Thomas J. Edge and C. B. Michener, on the part of the Board of Agriculture; Hon. John C. Morris and George Blight, on the part of the Pennsylvania Agricultural Society; and George S. Garrett, on the part of the dairymen of Philadelphia and vicinity. At the first meeting of this commission Hon. John C. Morris was elected president, and Thomas J. Edge, secretary.

At a meeting held in Philadelphia May 16, a large number of practical dairymen and veterinary surgeons were examined, and their evidence taken down by a stenographic reporter. As a result of this meeting Messrs. Morris, Butler, and Greenawalt were appointed a committee to report to Governor Hoyt, on behalf of the commission, that the disease did exist in at least two counties in the State, and that the decision of the commission was unanimous.

Under authority of the Act before quoted, and based upon the report of the commission, his Excellency Governor Hoyt appointed a special agent to take charge of the matter, to whom he issued the following commission:

"It having been ascertained that an infectious and contagious disease of neat cattle, known as pleuro-pneumonia, has been brought into and exists in certain counties of this State, I hereby appoint you as my assistant to carry out the provisions of the Acts of 1866 and 1879, for the prevention of the spread of this disease. As such assistant you are hereby authorised:

"To prohibit the movement of cattle within the infected districts, except on license from yourself, after skilled veterinary examination, under your direction.

"To order all owners of cattle, their agents, employés, or servants, and all veterinary surgeons to report forthwith to you all cases of disease by them suspected to be contagious; and when such notification is received, you are directed to have the case examined, and to cause such animals as are found to be infected with said disease to be quarantined, as also all cattle which have been exposed to the infection or contagion of said disease, or are located in an infected district; but you may, in your discretion, permit such animals to be slaughtered on the premises, and the carcases to be disposed of as meat, if upon examination they shall be found fit for such use.

"You may prohibit and prevent all persons not employed in the care of cattle therein, kept from entering any infected premises. You may likewise prevent all persons so employed in the care of the animals, from going into stables, yards, or premises where cattle are kept, other than those in which they are employed. You may cause all clothing of persons engaged in the care, slaughtering, or rendering of diseased or exposed animals, or in any employment which brings them in contact with such diseased animals, to be disinfected before they leave the premises where such animals are kept. You may prevent the manure, forage, and litter, upon infected premises from being removed therefrom; and you may cause such disposition to be made thereof as will, in your judgment, best prevent the spread of the disease. You may cause the buildings, yards, and premises, in which the disease exists, or has existed, to be thoroughly disinfected.

"You are further directed, whenever the slaughter of diseased animals is found necessary, to certify the value of the animal or animals so slaughtered, at the time of slaughter, taking into account their condition and circumstances, and to deliver to their owner or owners, when requested, a duplicate of such certificate. Whenever any owner of such cattle, or his agent or servant, has wilfully or knowingly withheld, or allowed to be withheld, notice of the existence of said disease upon his premises, or among his cattle, you will not make such certificate.

"You are also directed to take such measures as you may deem necessary to disinfect all cars or vehicles or movable articles by which contagion is likely to be transmitted. You will also take such measures as shall insure the registry of cattle introduced into any premises on which said disease has existed, and to keep such cattle under supervision for a period of three months after the removal of the diseased animal and the subsequent disinfection of said premises.

"You are further authorised and empowered to incur such expenses in carrying out the provisions of the foregoing orders as may, in your judgment, appear necessary, and see to it that all bills for such expenses be transmitted to this department only through yourself, after you have approved the same in writing.

(Signed) HENRY M. HOYT,
Governor.

"Attest: J. R. McAffee,
Deputy Secretary of the Commonwealth."

The agent of the Governor has issued the following notice:—

To all owners of cattle, their agents, servants, or employés; to all common carriers by land or water; to all veterinary surgeons, and to all others whom it may concern.

His Excellency Governor Hoyt having decided to co-operate with the executive officers of the States of Massachusetts, Connecticut, New York, and New Jersey, in a united effort to eradicate the disease known as pleuro-pneumonia from the herds of the State, it becomes my duty, under the foregoing commission, to request that you will promptly report to me all cases among neat cattle by you suspected to be contagious or infectious. Without your co-operation and assistance this attempt can only result in partial success; with it the result can scarcely be doubtful, and the work thus far accomplished gives us assurance of good results.

His Excellency is anxious that all owners of cattle, and others interested, should be fully impressed with the belief that this commission, as well as the laws of 1866 and 1879, for the prevention of the spread of the disease, are in their interest as well as that of the State. It is also the wish of his Excellency, that while the provisions of these laws are fully enforced and made most effective, and their purposes promptly and fully accomplished, it shall, at the same time, be so managed as to cause the least possible inconvenience and injury to all concerned, and with a minimum of expenditure to the State.

I would particularly call your attention to the language used by his Excellency in relation to the line of action to be pursued when interested parties have concealed the existence of the disease in their herds. This provision is very important, not only to the stock owner, but also to the State, for while the concealment of the existence of the disease will result in pecuniary loss to the owner of the stock, it at the same time greatly increases the danger of infection, and the subsequent expense to the State. With your active co-operation in this respect we may hope for the prompt suppression of a disease which, while it has already caused a great loss to our stock owners will, should it become established in our western States, inflict an incalculable and lasting injury to the stock-raising interests of the whole nation. So far as known, all infected herds in this State have been quarantined, and all diseased animals promptly isolated or killed. In the future, as in the past, it will be our duty to cause as little injury and inconvenience to the owners of stock as is consistent with our duties to the State, and to carry out to the full letter the directions of his Excellency relative to the valuation of all stock condemned and killed.

All reports of supposed infection should be made direct to the office, and all interested are requested to accompany the report with a correct and full account of the location of the herd, and the symptoms, in order that all unnecessary expense to the State may be avoided. No special line of action has yet been marked out for application to cattle in motion from one portion of the State to another, or to those in transit to other States, but it will be the duty of those in charge to cause the least possible inconvenience consistent with the best interests of the State.

Action of the State Authorities.

Under the commission before quoted the agent of the Governor has (up to November 1) quarantined 27 herds, including four hundred and eight animals liable to infection, and distributed in the following counties:—Adams, 1; Lancaster, 4; York, 1; Bucks, 1; Delaware, 4; Montgomery, 5; and Chester, 11. Of these herd 8 (1 in York, 3 in Montgomery, and 4 in Chester) have since been released from the quarantine, and pronounced safe from another outbreak, except from a fresh infection from outside sources.

As soon as the supposed existence of the disease is reported, each animal in the herd is inspected by a veterinary surgeon in the employ of the State, and if the disease is found to exist, is promptly quarantined to prevent its spread to adjoining herds, in order, and if possible, to prevent further contagion in the same herd, all diseased animals are appraised and killed.

The individual history of these herds may be briefly given as follows:—

No. 1. In York county, infected by steers bought in Baltimore market. Six head were either lost by death previous to quarantine or were killed for the purpose of stopping the disease. The whole herd were more or less affected, though a number had a very light attack, and when released from quarantine, September 4, were as well as they probably ever will be. A rigid quarantine, which was very much assisted by the losal surroundings, and the prompt support of neighbouring stock owners, prevented the disease from infecting other stock, and the killing of diseased animals, and the use of disinfectants prevented further loss.

No. 2. Containing 20 cows, 2 bulls, and 10 calves, was quarantined June 12. Previous to quarantine four head had died, and after the enforcement of the quarantine 14 head were killed. With one possible exception all the animals were affected, and a number of them are now in a condition in which they are worse than useless to the owner. In this case the evidence is strongly in favour of the theory that the owner conveyed the disease to his herd by assisting in the care of another infected dairy. No spread of the disease to adjoining farms; but it is quite probable that the disease was carried from this herd to herd No. 8 in the clothing or on the person of the owner, who administered medicine to both herds. This herd has furnished an illustration of the disease in one of its worst forms, but is now believed to be clear, but not beyond the danger of infecting other stock.

No. 3. In Delaware county, contained 50 head of stock, and previous to quarantine a number had died. The probability is that the disease was introduced by purchase. After passing into the charge of the State authorities, 11 of the herd were killed. This herd, with Nos. 2 and 7, furnish by far the most stubborn cases we have yet met with. In all three cases every animal had been repeatedly exposed to infection before the existence of the disease was reported, and we may here state that in other herds when the first sick animals were promptly isolated and the case reported the loss by death has been very slight. By allowing the sick and well to run together all are infected before the assistance of the State is asked.

Nos. 4, 5, and 5½. Adjoin one another, and the farms are all traversed by the same small stream. The disease seems to have originated on the upper farm, where the first sick animal died in the stream, and was buried close to its banks. In No. 4 one animal died, and one was killed; and in No. 5 the first one was promptly killed. In both cases the importance of immediate isolation was understood and put in practice. Nos. 4 and 5 have been released from quarantine, but No. 5½ is still infected. Whether, in these cases the stream was the vehicle of contagion or not we cannot say, but the almost simultaneous outbreak on the three farms can be accounted for on no other hypothesis.

No. 6. Had lost 11 head previous to being reported and quarantined. With one doubtful exception, every animal had shown more or less of the effects of the disease, and its owner fully appreciated its contagious nature. Has been released from quarantine.

No. 7. In Lancaster county, was composed of 42 animals, and when reported had been thoroughly infected by two sick animals running with the herd. In this herd seven animals were killed in one day, and seven placed under quarantine; 15 have been killed, and to all appearance the disease has been checked. The infection, no doubt, came from an adjoining herd, which in turn had been infected by stock from New York.

No. 8. Is supposed to have been infected by the owner of No. 2 administering medicine to the animals after attending to his own. Seven head have been lost in this herd, and the others are not clear of the danger.

In No. 9, containing 31 head, the disease seems to have been checked by the prompt isolation and killing of one animal, and has since been released from quarantine.

Nos. 10, 11, and 12. Are small herds, in two of which every animal exhibited symptoms of the disease, but by rigid care on the part of the owners by isolating, and the prompt death of infected animals, the loss has been small.

Nos. 13 to 20 inclusive. Are herds which have been recently reported and quarantined, and, thus far, the losses in them have been slight. By the prompt action of the veterinary surgeon, assisted by care and co-operation on the part of the owner, it is hoped that most, if not all of them, have past the worst point, and that some of them may be released from quarantine as soon as the proper time has elapsed.

No. 21. Was infected by six cows purchased in the Philadelphia market, and showed itself 10 days after the purchase; of the six, five have died or been killed, and others are affected. The purchased cows have been traced to the Philadelphia droveyard, but here all further clue to the origin of the disease was lost.

No. 22. In Montgomery county was quarantined October 24, and was infected by a cow purchased from a drover; at the time of purchase she was coughing, and when examined by our surgeon in a week afterwards she was too far gone that the owner was willing to have her killed as worthless and without value.

No. 23. Was infected by contact with the animals in herd No. 16 previous to quarantine; at the request of the owner, who had insured complete isolation, they are being treated by our surgeon. In this case the fumes of burning sulphur seems to have been effective in preventing further trouble, but all the herd were or are more or less affected.

No. 24. Containing 33 head were, no doubt, infected by contact with herd No. 7, as, by accident, they were in the inclosure containing the former herd for a short time.

No. 25. Was allowed by its owner to graze alongside of No. 7 with no separation other than that afforded by a creek and common fence. Before the infection was reported, most of the steers (fat) were sent to market, but one left on the farm has shown all symptoms of the disease.

In addition to the care of stock already in the State, the agent of the Governor has had control of all the stock brought into the State from Europe, and not quarantined by the national authorities or those of other States. The United States Government imposes a quarantine of 90 days upon all such cattle, but in such States as have quarantine regulations already established, they are surrendered to the State authorities for inspection and quarantine. Under these rules now in force in this State, these cattle must present a certificate of clearness from any contagious disease at the point of shipment in Europe, where they are inspected by a government surgeon, must be inspected on their arrival in the State by a veterniary surgeon in the employ of the State and under the control of the Governor's agent, must be quarantine closely at the expense of the importer, under the supervision of the State Surgeon, and must be again examined at the close of the quarantine, and if found clear, are granted a certificate which will authorise the removal to any point in the State. In enforcing this quarantine, care is taken to consult the interests of the importers so far as it is consistent with the interests of the State, and the step is made necessary also only to protect our stock from infection by pleuro-pneumonia, but not with hoof-and-mouth disease, rinderpest, and other contagious diseases.

Name, History, Nature, and Symptoms of the Disease.

It is unfortunate that the common name, pleuro-pneumonia, should have been selected to designate this disease. In the debates in the Legislature during the passage of the Act, in the daily correspondence of the Board of Agriculture, in the agricultural and daily papers, and even in some scientific journals, this name has caused much confusion and needless dispute. By many it has been confounded with common or sparodic pneumonia, which is not contagious, and which may in all cases be traced to exposure, neglect, or to a violation of some law of nature. This common pneumonia will *originate* in a locality, while the lung plague, called pleuro-pneumonia, has never yet been proven to thus originate in any locality in this country; but if its cause can be traced at all it is found to have proceeded from contagion conveyed by another animal, or from the excretion from the bowels, kidneys, skin, or lungs of another animal. No amount of neglect or bad treatment will develope this disease, and we think it may be assured that no bad treatment or abuse will develope a contagious disease of this kind. It is now too late to hope to effect a change of name, but many have been suggested as not only more appropriate, but also more satisfactory to the general reader and average stock breeder. Professor Hertwig, of Berlin, gave it the name of *Lungenseuche*, Haller called it *Viehseuch*, Cathbert styled in *Peri-pneumonia*, in Italy it is known as *Pulmonæ de bovini.* In fact, in different countries, and at different times, it has had names of all lengths and styles, from the " Murie " of Brougelat to the " *Peri-pneumonia exsudation enzootica et contajiosa* " of Gieleu. Throwing aside all technicalities and form, we think that the plain name, " Contagious lung plague " will best suit the case.

When, where, or how this disease first originated (for it must have had an origin) no one can say with any degree of certainty. Delafond quotes Aristotle as writing of his time, that " The cattle which live in herds are subject to a malady, during which the " breathing becomes hot and frequent. The ears droop and they cannot eat. They die " rapidly, and on opening them the lungs are found spoiled." The history of the disease in this country may be thus briefly summed up.

The first notice of its existence was in a cow imported from Germany in 1843, and landed in Brooklyn, and it has been claimed that since then this locality has never been free from the disease, and now forms the main centre of contagion with which the New York authorities have to contend. In 1847, it was brought from England into New Jersey, and in 1850 was again brought into New York by a cow inported from Europe. It was prevalent in Camden and Gloucester Counties, New Jersey, in 1859, and in 1860, broke out among the dairies near Philadelphia. In 1861 it broke out in Delaware County. The Philadelphia cow market served as a centre, and the contagion gradually spread to surrounding counties, and soon Baltimore and the surrounding district was affected, and the disease now threatens to obtain a foothold in southern counties of our State from this centre of contagion.

The dairyman who have lost from 50 to 75 per cent. of his stock, has very little sympathy with any one who will claim that the disease is not contagious. Finding a newly purchased animal sick with an, to him, unknown complaint, which defies all treatment, and soons runs its course in the first animal, and sooner or later attacking every animal of the herd, in some cases proving fatal in more than 50 per cent. of the attacks, and leaving those which *apparently* recover, in many cases, in a condition worse than useless, he discards all fine theories, all fine-drawn arguments of medical men, and assumes that he has to deal with a contagious disease over which he can exercise little or no control.

When, as has been the case in this State since the passage of the law of last winter, he sees seven of his animals all at the same time affected with the same symptoms, each passing through exactly the same stages of disease, and when killed and opened, each presenting exactly the same post-mortem evidence of the same disease, his common sense teaches him that the sick contaminate the well, and that the disease will, in this way, not only spread from animal to animal, but also from herd to herd until the whole country will be infected.

The fact that inoculation will produce all the symptoms of the disease, and when a country becomes thoroughly impregnated with the disease is a last resort, is perhaps sufficient proof of the contagious nature of the disease, but as further proof, we quote as follows from our best authorities on the subject of this and other diseases:

Prof. Williams, of Edinburgh, in " The Principles and Practice of Veterinary Medicine," page 139, when treating of pleuro-pneumonia as contagious, says it is " A contagious " febrile disease peculiar to horned cattle having an incubative period of from two to " three weeks to as many months, at the end of which local complications arise in the " form of extensive inflammatory exudations within the substance of the lungs and upon " the surface of the pleura, finally resulting in consolidation of the pleural surfaces."

In his " Farmer's Veterinary Adviser," Prof. Law, in treating of this disease, says, (page 14–15), it is—

" A specific contagious fever of cattle, with extensive exudations into the chest and lungs. The period of latency of the poison in the system is from four to six weeks, and in exceptional cases perhaps two or three months, or as short as 10 days."

In his " Manual of Veterinary and Sanitary Science and Police," Fleming says (Vol. I., page 408): " This pleuro-pneumonia of cattle is a specific and contagious disease " peculiar to bovine animals, and of a sub-acute or chronic character. It usually appears " as an epizootic or enzootic malady, and in the subtility of its contagion, its general " diffusion, and the great fatality attending it, it is a most serious scourge. In every " country in which it has appeared it has caused an immense destruction."

In his work on " The Diseases of Live Stock," Dr. Tellor styles pleuro-pneumonia " A contagious fever of cattle, accompanied by great prostration, together with local " inflammation, and other diseased changes in the lungs and their envelops. This is no " doubt a specific blood poison."

In his " Four Bovine Scourges," Prof. Walley, of Edinburgh, says: " Zymotic " pleuro-pneumonia is an insidious exudative zymotic disease, due to a specific poison " or ferment, peculiar to the ox, and having its local manifestation concentrated in the " lungs and pleuro. No age, breed, or class, neither sex of bovine species enjoy " immunity from the effects of the virus of this disease. Zymotic pleuro-pneumonia has " a well-defined, though extremely uncertain incubatory stage, and it is alike contagious " (by actual cohabitation) and infectious."

In his report to the National Government (illustrated edition, page 29), Prof. Gamgee, says: " Not only have theories in relation to the cause or combination of causes which " may lead to the development of pleuro-pneumonia been unsatisfactory, but opportunities " are constantly presenting themselves to test the fact that privations, over-crowding, " impure food and water, &c., singly or combined, may help, but never induce the " disease which presents the characteristics of the one referred to in this report. The " malady may be produced at will, by placing an animal suffering from it among healthy " ones, and by direct inoculation. These are the only methods by which it is propa- " gated."

In his official report, Hon. W. C. Le Duc, National Commissioner of Agriculture, states that " Pleuro-pneumonia is a malignant contagious fever, to which, as far as " known, cattle only are only liable, and in them is accompanied by inflammation and " other diseased conditions of the lungs and their membranes, together with great " prostration of the entire system. It proceeds from a poisoned condition of the blood. " How, when, or where this poison was first generated it is impossible to tell. Nor is it " less difficult to determine its specific nature. So far as reliable information has yet " reached, it is never generated spontaneously, but depends entirely on the introduction " of a virus or contagion into the system of a healthy animal. A single animal so " infected infects the herd; the herd, sub-divided and scattered, infects other herds, " until in time large areas of country have been visited and devastated by the fearful " scourge."

Symptoms.

In its earlier stages it is very difficult to detect this desease, but in all cases where animals have been recently purchased, or where the affection is plainly one of the lungs, it is safest to assume that it is the so-called pleuro-pneumonia, and at once isolate the animal. If it is the disease it will soon make itself known by its after symptoms; if it is not, no harm is done byond the small amount of additional trouble caused by the isolation.

In its incubatory or first stage the disease is not accompanied by that intense inflammation which afterwards is manifest; yet there is in all cases a slight increase in the temperature, as shown by a thermometer inserted in the rectum. This latter test alone will not prove satisfactory, because a rise in temperature may proceed from other diseases and other causes than pleuro-pneumonia, and as a rule, our surgeons place little reliance upon this test, except when, in addition to other symptoms of a more decided nature, it may be taken as cumulative evidence. While owing to peculiarities in constitution, different animals are affected (in the primary stages) to different degrees and in different ways, we merely take the following as covering a large majority of cases.

In all cases there is more or less shivering, which, in many cases being slight, may pass unnoticed, or which may result from any other cause producing fever. In milking cows, one of the primary results of infection is often an increase in the amount of milk, which naturally results from the unusual excitement of the nervous system, but in a very short time this passes off, and instead of giving a large pail full, as at the previous milking, the amount will often quickly fall off to less than one quart. The animal shows an evident disinclination to associate with the others, and is usually to be found in a fence corner or corner of the yard, by itself. If the herd are accustomed (as is the case with milk cows) to come up to the buildings at certain hours, the infected animal will usually linger behind the others, or will refuse to come in at all. In such cases, if a ditch is to be crossed, it will usually be found upon the bank furthest from the building. The pulse is much increased and the respiration irregular and much disturbed. The animal stands with its back arched, and on applying the ear closely on the diseased side, an unusual and abnormal sound may be detected, similar to that caused by the friction of two thin pieces of dry paper or partially dried hide.

As the disease progresses, the surface of the body and the extremities become cold; the mucous membrane at the external orifices of the body becomes hot, and indicative of the inflammation within; the bowels in a majority of cases become constipated, but in some cases which have come under our notice the reverse has been the case; the skin becomes dry, the coat stares, shivering fits set in, the breathing becomes more hurried, and the pulse reaches 85 to 90 per minute, and an increased harshness or grating is heard in the diseased lung and bronchial tubes. A peculiar dry and husky cough sets in which is heard in no other disease, and which, having once been heard, although it cannot be described, is at once recognised by the surgeons or by the stock-owner who has been so unfortunate as to have the disease in his herd. In the concluding stages all these symptoms are very much intensified; the cough becomes more frequent, and from its increased intensity and the weakened condition of the animal, evidently is more painful, and is usually accompanied by a peculiar grunt or moan, indicative of intense pain. If not so before the bowels become constipated, the skin is more tightly drawn over the protuberances of the body, flesh is lost rapidly, much more so than can be accounted for by the mere abstinence from food; the pulse becomes very irregular, and the animal seeks release from the pain and difficulty of breathing by standing with its elbows thrown out from the chest, and intense pain is shown by a pressure on either side of the spine just back of the shoulders. In the later stages of the disease there is usually a peculiar twitching of the nostrils and corners of the mouth, the exhaled breath is very offensive, and is plainly indicative of the corruption which exists within.

The veterinary surgeon of the Board of Agriculture gives the following summary of the physical symptoms which, after a very little practice, has enabled those who have the disease in their herds, *by a daily examination*, to select the infected animals and at once isolate them, and thus save much loss to themselves and expense to the State:

" By placing your ear at the bottom of the neck, a loud rushing sound of air is heard in the tracheæ and bronchial tubes. The same sounds are heard at the top and sides of the chest, just behind the shoulder blade. Below and back of these parts no sound at all is heard, showing that the lungs are consolidated by the fibrous exudations which are being constantly thrown out. At the commencement of an attack, we can often notice what is called the 'friction sound,' from the rubbing together of the thickened and rough membranes during respiration. Should one lung only be affected, the respiratory murmur in the healthy lung is much increased, in consequence of its having to perform double duty. When both lungs are diseased, we expect peculiar effects and sounds, according to the intensity and extent of the lesions. There is increased resonance on percussing the healthy lung, while over the diseased part, a dull, heavy sound is elicited."

In all cases, a post-mortem examination should be made which will indicate some or all of the following conditions, as given by the surgeon of the Board on Agriculture :—

"On exposing the thorac viscera, one of the first indications of epizootic pleuro-pneumonia is the escape of large quantities of fluid from the cavity. This fluid mostly contains large patches of yellow, plastic, or coaguable lymph floating about in it. As a result of the inflammation which has been going on, we find that this plastic lymph has fastened the lungs to the ribs, and formed what we know as 'false membranes,' or 'adventitious tissue.' These false membranes are sometimes fastened to the diaphragm and heart, as wells as the sides of the chest. The lungs are found to be exceedingly heavy, often weighing from fifty to seventy-five, and even one hundred pounds, sink in water, and instead of the bright salmon colour of health we observe a dirty gray colour, mottled, and having the appearance of marble. The surfaces are rough and thickened, and the lung substance hard and firm. The bronchial tubes are frequently found entirely blocked up with fibrinous deposits, thus shutting off the contact of air with the blood, and producing death by suffocation.

This exclusion of the atmospheric air from the lungs accounts for the dark purplish colour of the transuded blood corpuscles, and fibrinous exudations. In some of the more advanced cases, abscesses are found in the substance of the lungs, which either discharge through the bronchial tubes undergo degeneration (the *amyloid* most freqnently), or else the discharge takes place within the chest, which give rise to the *amphoric rale.* All the other organs of the body are (as a rule) found to be in a state of health."

Conclusion.

In our dealings with the disease under the immediate direction of the Government, we find many points upon which scientists differ, and which it would be impolitic for a layman like ourselves to endeavour to settle; but of one point we feel certain, and in which we have the indorsement of *every* practical man who has had the disease among his stock, and this is the contagious and dangerous nature of the disease. Whether the disease can only be conveyed from animal to animal by actual contact, or whether it can or cannot be conveyed in the clothing, by the excretion, breath, or animals of another tribe; whether the disease is of ancient or of comparatively recent origin; whether it can be carried from herd to herd by a stream of water; whether it can be intensified in its ravages by bad ventilation or bad treatment; whether a complete separation of a certain specified number of feet of space will or will not prevent infection; whether in its first stages it is or is not contagious; whether it will or will not affect sheep, are all questions for scientists to determine, and which all are lost sight of in the one great question, in the solution of which we are engaged—can the disease be eradicated by prompt and rigid action in the manner proposed? If so, all these questions can be solved in the future; if not then the future of our stockbreeders is indeed precarious. In defense of the proprietory of the action of the joint committne of the Legislature, and of the Legislature itself, as given in the foregoing pages, we have nothing to say, except that the end in view justifies the means. If by the expenditure of a few thousand dollars by the State, we can save hundreds of thousands to her stock breeders and stock owners, and as many millions to the country at large, then we think no one will complain. If the result in New York, New Jersey, and Pennsylvania shall demonstrate that this cannot be done, we may still point with pride to the fact that this action has saved more thousands than it has cost hundreds; has demonstrated to other States that when Pennsylvania is appealed to for co-operation in a good cause, she is not slow to respond; and that when so important an interest is in danger, the State is not slow in her attempt to extend a helping hand.

No. 34.

LETTER from the BRITISH CONSUL-GENERAL at NEW YORK to the MARQUIS OF SALISBURY.

My Lord, British Consulate General, New York, February 4, 1880.

I have the honour to report to your Lordship that the sanitary condition of cattle in this consular district is practically the same as was mentioned in my Despatch (Consular No. 6) of the 5th ultimo on the subject.

I have, &c.

Her Majesty's Principal Secretary of State for Foreign Affairs, London. (Signed) E. M. ARCHIBALD.

No. 35.

LETTER from FOREIGN OFFICE to the CLERK OF THE COUNCIL.

Sir, Foreign Office, February 20, 1880.

With reference to the letter addressed to you from this Department on the 25th of February 1879, on the subject of a circular issued by the United States Secretary of the Treasury ordering the inspection of live cattle shipped from United States ports and the issue of a certificate that they are free from contagious and infectious diseases, I am directed by the Marquis of Salisbury to transmit to you, to be laid before the Lords of Her Majesty's Privy Council, the accompanying Despatch from Her Majesty's Minister at Washington, inclosing a copy of a note from Mr. Evarts, in which he asks for early information as to whether Her Majesty's Government is willing to make such a modification of the regulations upon the subject as would recognize certificates issued by the Customs authorities of the United States, under the above-mentioned circular as sufficient to exempt cattle inspected under its provisions from slaughter upon being landed; and I am to request that you will move their Lordships to inform Lord Salisbury what answer should be returned to Mr. Evarts on this subject. Nos. 1 and 2. No. 3.

I am also to request that the enclosed papers may be returned with your reply.

I am, &c.

The Clerk of the Council, Veterinary Department. (Signed) JULIAN PAUNCEFOTE.

Enclosure 1 in No. 35.

Letter from Sir E. Thornton to the Marquis of Salisbury.

My Lord, Washington, January 26, 1880.

In my Despatch No. 13 Consular of the 10th of February 1879, I had the honour to enclose copies of a circular issued by the United States Secretary of the Treasury, ordering the inspection of live cattle shipped from United States ports and the issue of a certificate that they are free from contagious and infectious diseases.

In a note of the 23rd instant, which I have received from Mr. Evarts, and copy of which is enclosed, he refers to this circular, and asks for early information as to whether Her Majesty's Government is willing to make such a modification of the regulations upon the subject as would recognize certificates issued by the Customs authorities of the United States, under the above-mentioned circular, as sufficient to exempt cattle inspected under its provisions from slaughter upon being landed.

A copy of my reply is also enclosed. In it I have stated that I would forward to your Lordship a copy of his note by the earliest opportunity; but I thought it my duty at the same time to point out to him that pleuro-pneumonia exists amongst cattle in many parts of the United States, and particularly in the immediate neighbourhood of ports from which cattle are being shipped to England. This is true with regard to Philadelphia and New York. And I observed that whilst the inspection is actually being carried on and the cattle are pronounced sound, they may by contagion be taking the disease which may not develope itself for some weeks later.

I at the same time expressed my hope that such laws would be passed by Congress as would tend to obliterate the disease in this country.

I also called upon Mr. Johnston, a senator from Virginia, who is chairman of the Committee on Agriculture, and represented to him in the most earnest manner of how much importance it was that stringent and uniform measures should be taken throughout the United States for eradicating the disease, and he entirely agreed with me that this could only be done by a thorough inspection, by destroying all such cattle as were found to be diseased, and by indemnifying their owners. He informed me that it was the intention of his Committee to submit to the Senate a Bill which would have this object in view, and making the necessary appropriation for carrying it out. I have spoken to some other senators in the same sense, and I am glad to see that people are awakening to the importance of preventing the great cattle trade which is growing up between the United States and Great Britain, as well as other European countries, from being prejudiced by the well-founded apprehension that the imported cattle may be infected with pleuro-pneumonia.

I have, &c.
(Signed) EDWD. THORNTON.

The Marquis of Salisbury, K.G.,
&c. &c. &c.

Enclosure 2 in No. 35.

LETTER from MR. EVARTS to SIR E. THORNTON.

Sir,

Department of State, Washington, January 23, 1880.

REFERRING to previous correspondence, and particularly to my note to you of the 6th of February last, in which I transmitted to you a copy of a circular of the Treasury Department, dated the 1st of that month, making the inspection of cattle intended for exportation compulsory before shipment, and in which note I at the same time informed you of the desire expressed by the Secretary of the Treasury to do all in his power to prevent the introduction into foreign countries of diseased cattle, and the hope entertained by him that the Treasury Department circular in question would accomplish the object in view, I now have the honour to recall your attention to the subject in consequence of information received through the Treasury Department from exporters of cattle to the effect that the certificate of the Customs officers of the United States given in pursuance of the above-mentioned circular is not accepted as of any force by the officers of Her Majesty's Government in Great Britain.

In view of the importance of the interests involved, and in order that exporters of cattle may not be put to a useless expense for inspection, I would be obliged to you for early information as to whether Her Majesty's Government is willing to make such a modification of the regulations upon this subject as would recognize certificates issued by the Customs authorities of the United States, under the circular of February 1st, 1879, as sufficient to exempt cattle inspected under its provisions from slaughter upon being landed.

I have, &c.
(Signed) WM. M. EVARTS.

The Rt. Honble. Sir Edwd. Thornton, K.C.B.,
&c. &c. &c.

Enclosure 3 in No. 35.

LETTER from MR. EVARTS to Sir E. THORNTON.

Sir,

Washington, January 24, 1880.

I HAVE the honour to acknowledge the receipt of your note of yesterday's date inquiring whether Her Majesty's Government is willing to make such a modification of the regulations respecting the importation of cattle into England from the United States as would recognise certificates issued by the Customs authorities of the United States under the circular of February 1, 1879, as sufficient to exempt cattle inspected under its provisions from slaughter upon being landed.

I shall not fail to transmit a copy of your note to the Marquis of Salisbury by the earliest opportunity. At the same time it is with much regret that I am compelled to admit the fact that fresh outbreaks of pleuro-pneumonia are constantly showing themselves in different parts of the United States, and in some instances in the immediate neighbourhood of the seaports from which cattle are frequently shipped from England.

Cattle arriving from the Western States at these ports are not known to be infected with this destructive and highly contagious disease; but as long as it exists at the ports from which they are shipped there is constant danger of contagion; and at the very moment that the inspectors are examining the cattle and pronouncing them sound, they may be absorbing the germs of the disease, which do not however generally develope themselves for many weeks after their shipment.

By the Circular of the Treasury Department of the 11th July 1879 collectors of customs are instructed not to admit neat cattle from Canada unless they shall be satisfied that they were not imported directly or indirectly from England, or that if so imported they did not arrive in that dominion within 90 days prior to their arrival at a port in the United States. It would, therefore, appear that it is the opinion of the Treasury Department that the incubation of the disease may last for about that time, and that cattle cannot be considered safe until its termination. It is, therefore, justifiable and natural that the same apprehensions should be entertained in England with regard to cattle arriving from the United States in many points of which it is known and admitted that pleuro-pneumonia exists.

I venture to hope, however, in the interest both of Great Britain and the United States that Congress will in its wisdom pass such laws as may have the effect of obliterating the disease in this country, even if it be at the expense of a considerable outlay, though but a trifle compared with the loss of property which would arise from the continuance and spread of this destructive disease.

I have, &c.
(Signed) E. THORNTON.

The Hon. William Evarts,
&c. &c. &c.

No. 36.

LETTER from the ACTING BRITISH CONSUL at PHILADELPHIA to the MARQUIS OF SALISBURY.

(No. 2 Sanitary.)

MY LORD, British Consulate, Philadelphia, February 21, 1880.

I HAVE the honour to report to your Lordship that the cases of pleuro-pneumonia in Lehigh county and Montgomery county of this State, reported in my Despatch No. 1 Sanitary of the 20th ultimo, have been checked. At these places several additional head were killed, some others have died, and the remainder have been kept in strict quarantine.

Fresh cases have occurred at West Chester, a wealthy farming district of Chester County, Pennsylvania. Five or six head have been killed, and a strict quarantine is exacted by the State Commissioner.

The disease is not likely to spread beyond the farm now affected.

No cases, as far as I have been able to learn, have occurred in any of the Western States of this consular district.

I have the honour to enclose your Lordship copy of the Report of the Board of Agriculture of the State of Pennsylvania for the year 1879, containing an interesting article on lung fever written by the special agent of the Governor of the State. I have applied for additional copies of this printed document, and should I succeed in obtaining them I will forward to your Lordship two more copies.

I have, &c.
(Signed) GEORGE CRUMP.

The Right Hon. the Marquis of Salisbury.
&c. &c. &c.

No. 37.

LETTER from SIR E. THORNTON to the MARQUIS OF SALISBURY.

(No. 3 Sanitary.)

MY LORD, Washington, February 23, 1880.

I HAVE the honour to inform your Lordship that on the 20th instant the Secretary of the Treasury transmitted a report to Congress relating to the existence of pleuro-pneumonia among cattle in this country. As soon as this report shall have been printed, I shall forward copies of it to your Lordship.

In the meantime I enclose copies of a précis of the report which has been published in one of the Washington papers, from which it will be seen that the principal conclusions arrived at are as follows :

That the disease is contagious, but may be prevented by inoculation.

That its period of incubation is from nine to 30 days, and not exceeding 40 days.

That the destruction of diseased cattle is the only method of suppressing the disease.

That it does not exist west of the Alleghanies, nor in the United States near the Canadian border, nor in Canada, but is found only in the eastern part of New York, in New Jersey, Pennsylvania, and possibly in parts of Maryland, Virginia, and District of Columbia.

That the general course of the traffic in cattle is from the west to the east, and with proper care and restrictions cattle may pass thence through and out of the eastern ports without danger.

That State regulations do not suffice to prevent and suppress the disease, and that stringent quarantine regulations are essential to protect the country from its importation.

That there should be a Commission to investigate and report upon the disease, and that it should be authorised to co-operate with State and municipal authorities, and to isolate and slaughter diseased cattle, compensating the owners, the necessary funds to be furnished by Congress.

The report was referred to the Committee on Agriculture, and I am not without hopes that Congress is beginning to awaken to the importance of the subject, and that some legislation may be carried through the present session with a view to preventing the further spread of the disease.

I have &c.

(Signed) EDWARD THORNTON.

The Marquis of Salisbury, K.G.
&c. &c. &c.

Enclosure in No. 37.

Extract "Washington Post," February 21, 1880.

THE CATTLE DISEASE QUESTION.

The Secretary of the Treasury yesterday sent to Congress a communication on the subject of pleuro-pneumonia in cattle. He gave a history of the disease, and some general observations concerning its effect upon commerce. He then proceeds to give a summary of the conclusions arrived at, and his ideas as to appropriate legislation on the subject. These conclusions are embodied 16 distinct propositions, as follows :

First.—Pleuro-pneumonia is a contagious infectious lung fever in neat cattle, as readily communicated among them as small-pox among mankind, not only by actual contact, but by excretions of all kinds.

Second.—In this country it has never developed *de novo*, but has always been introduced by contagion.

Third.—It may be prevented by inoculation, but that remedy is not thought of in this country under present conditions.

Fourth.—It has a period of incubation of from nine to 30 days, not exceeding 40 days, and its symptoms, when developed, are easily distinguished by experts from those of other diseases.

Fifth.—The only proper method of suppressing the disease in the United States is by the destruction of all diseased or exposed cattle and a thorough purification of the buildings where they have been kept.

Sixth.—No contagious pleuro-pneumonia now exists or has existed west of the Allegheny mountains.

Seventh.—It does not now exist in the United States, on or near the Canadian border, and does not now exist in that Dominion.

Eighth.—The disease now exists only in the eastern part of New York, in New Jersey, Pennysylvania, and, possibly, in parts of Maryland, Virginia, and district of Columbia.

Ninth.—The general course of traffic in cattle is from the west to the east. Only a few animals of blooded stock of great value pass westward or into Canada from the east.

Tenth.—At the present time, with ordinary care, cattle may pass from the Western States, which almost exclusively furnish cattle for exportation into Canada, and through Canada, Portland and Boston to foreign ports without danger of infection.

Eleventh.—With proper restrictions against contact with other cattle near the seaboard, cattle may pass from the Western States to the ports of New York, Pennsylvania, and Baltimore without danger of infection.

Twelfth.—State and municipal regulations are not to be relied upon to prevent the importation and spread of the disease, or to effect its extirpation.

Thirteenth.—Stringent quarantine regulations are essential to the protection of this country against its introduction.

Fourteenth.—A veterinary sanitary commission, whose duty it shall be to investigate all reports of the existence of the disease, collect information respecting it, and report to some department that publication is essential to efficient action on the subject.

Fifteenth.—Authority for such a commission to operate with State and municipal authorities in preventing and eradicating the disease. Supplying money out of appropriations by Congress for the purpose would be effective, and is in accordance with Acts of Congress in reference to the National Board of Health.

Sixteenth.—Authority in such board to promptly isolate and slaughter infected and diseased cattle wherever found, and to award compensation to the owners, would be an effective agency in extirpating the disease. It is for Congress to consider the policy and legality of conferring such power.

The document was referred to the Committee on Agriculture.

No. 38.

LETTER from the CLERK OF THE COUNCIL to the UNDER SECRETARY OF STATE, FOREIGN OFFICE.

Sir, February 28, 1880.

I have submitted to the Lords of the Council your letter of the 20th instant, enclosing a despatch from Her Majesty's Minister at Washington, with copy of a note from Mr. Evarts asking for early information as to whether Her Majesty's Government is willing to make such modification in the existing regulations in regard of live cattle shipped to this country from ports in the United States of America as would recognise certificates issued by the Customs authorities of the United States under the Circular of 1st February 1879 (also enclosed) as sufficient to exempt cattle imported under its provisions from slaughter after being landed.

In reply, I am directed to call the attention of Lord Salisbury to my letter No. 61226 of February 27th, 1879, in which it was stated that their Lordships had carefully considered the orders which had been issued by the American Government in the Circular dated February 1st, 1879, for the inspection of cattle previous to exportation, but that their Lordships were aware from their own experience that no system of inspection at the port, however perfect, affords complete security against the introduction of pleuro-pneumonia. These views, which their Lordships then expressed as to the impossibility of relying upon inspection, have been confirmed by the results of post-mortem examinations of cattle from American ports which have been landed at foreign animals wharves in this country for slaughter.

It appears that during 1879 there were 57 cargoes of American cattle in which pleuro-pneumonia was detected, the total number of animals in which the disease was found to exist was 137, a number far in excess of that which has been received during any year from all other exporting countries put together.

Between January 1st and February 20th of the present year 84 cattle affected with pleuro-pneumonia have been landed in this country.

Under these circumstances it must be evident that their Lordships could not make such modifications of the existing regulations on the subject as would recognise the certificates referred to in Mr. Evart's letter as sufficient to exempt American cattle from slaughter on being landed in this country.

I beg to return the enclosures as requested by you.

I am, &c.
(Signed) C. L. PEEL.

The Under Secretary of State,
Foreign Office.

No. 39.

LETTER from the BRITISH CONSUL-GENERAL at NEW YORK to the MARQUIS OF SALISBURY.

(Sanitary, No. 2.)

British Consulate General, New York,
March 8, 1880.

My Lord,

I have the honour to report to your Lordship that it has been publicly announced to carry out the provisions of the Pleuro-pneumonia Act which was passed last year by the Legislature of the State of New Jersey; that the Act in question has been repealed, to take effect on and after the 10th instant; and that the quarantine against the State of New York has been raised, so that in future all cattle will be allowed to enter New Jersey without permit.

This action on the part of the New Jersey State Legislature is no doubt attributable to the improved sanitary condition of cattle, not only in the States of New York and New Jersey, but also in other States in this consular district.

I have, &c.
(Signed) E. M. ARCHIBALD.

Her Majesty's Principal Secretary of State
for Foreign Affairs, London.

No. 40.

LETTER from SIR E. THORNTON to the MARQUIS OF SALISBURY.

(Sanitary, No. 6.)

Washington, March 23, 1880.

My Lord,

I have the honour to enclose copy of two Despatches which I received on the 20th and 21st instant respectively from the Acting British Consul at Baltimore, informing me that he has learnt that pleuro-pneumonia exists to a great extent amongst the cattle in some of the counties of Maryland, especially Harford county.

No. 1.
Nos. 2, 3, and 4.

He states further that two steamers have left Baltimore on or about the 18th instant with cattle, one for Bristol and the other for London, and he inquires whether he should be justified in informing your Lordship by telegraph of the appearance of the disease, with reference to the cargoes of the two steamers.

In his second Despatch Mr. Lawford expresses his opinion that the reports in question are not well founded.

No. 5.

In my answer, copy of which is also enclosed, I have instructed him to make further and particular inquiries as to the existence of pleuro-pneumonia amongst the cattle in certain parts of Maryland, and with regard to the place of origin of the cargoes of the two steamers in question; and that on the receipt of his answer I would consider whether it would be expedient to telegraph to your Lordship upon the subject.

It is probable, however, that I shall feel it my duty to telegraph to your Lordship to-morrow or the next day with regard to the cargoes of the two steamers; for it is said in the newspapers that one of the infected counties in Maryland is Baltimore county, in which the city of Baltimore is situated. I should imagine, too, that there is good ground for believing that the disease exists, for the matter is being discussed in the State Legislature by members who themselves are the owners of herds of cattle said to have been attacked by it, and Mr. Williams has introduced a Bill into the State Senate giving great powers to the Governor, when the existence of pleuro-pneumonia shall have been brought to his notice, for ordering the seclusion of deceased cattle, precautions for preventing the disease from spreading, and the destruction of deceased cattle, granting compensation to the owners. It is not probable that such a bill would have been brought before the State Legislature if there had been no truth in the assertion that pleuro-pneumonia exists amongst the cattle in certain parts of Maryland.

I have, &c.
(Signed) EDWARD THORNTON.

The Marquis of Salisbury, K.G.
&c. &c. &c.

Enclosure 1 in No. 40.

LETTER from the ACTING BRITISH CONSUL at BALTIMORE to SIR E. THORNTON.

(No. 7.)

SIR,

Baltimore, March 20, 1880.

WITH reference to my Despatch, Sanitary No. 2, of the 1st instant, to Lord Salisbury, through Legation, I now have the honour to report that I learn that pleuro-pneumonia exists largely amongst the cattle of some of the counties of this State, especially Harford county.

Two steamers within the past couple of days, the "Riversdale" for Bristol, with 130 head of cattle, and the "Indus" for London, with 136 head on board, have cleared, bearing Customs certificates as to the health of the cattle, and "that no cattle disease exists in this Customs district." On inquiry at the Custom House I learn that Harford county is within the Custom District of this port. These certificates have been certified by me to the effect that the deputy collector's signature and seal were genuine, and that the official is entitled to credence.

The surgeon inspector certified as to the health of the cattle, and the absence of contagion; the collector attaches to that a certificate authenticating the signature of the former, and I, in turn, am called upon to attest the fact of the collector's having signed the second document, which, of course I cannot refuse to do, though the collector's certificate covers an incorrect premise.

As the deputy collector has issued the certificates for the above-named steamers I pointed out to him the existence of an infectious disease amongst the cattle within the Customs District, but he stated that inasmuch as the cattle so shipped were directly from the West, and not from the infected districts, that he did not think the printed clause in the surgeon's certificate, as to the absence of infection in the district, would make much difference.

I have written to Harford county for some information regarding the outbreak which may prove useful to the Government.

The immediate object of this Despatch is to learn whether you think I would be justified in sending a cablegram as to the appearance of pleuro-pneumonia in my district so as to have a bearing upon the two outward cargoes now on their way.

Beyond the regular monthly reports as to cattle disease I have no further instruction from the Foreign Office in the premises.

I have, &c.
(Signed) J. W. LAWFORD,
Acting-Consul.

The Right Hon. Sir E. Thornton, K.C.B.,
&c. &c. &c.

Enclosure 2 in No. 40.

LETTER from the ACTING BRITISH CONSUL at BALTIMORE to SIR E. THORNTON.

(No. 7.)

SIR,

Baltimore, March 20, 1880.

SINCE posting my Despatch, No. 7, of this date to you, I have the honour to state that I have received a letter from Mr. T. W. Baker, the editor of the "Ægis and Intelligencer," of Harford county, a copy of which I have the honour to enclose.

From this letter it will be seen that the newspaper paragraph, on which I based my previous Despatch, and which clipping I also enclose, does not appear to be well founded.

Besides this, the deputy collector of customs called in to say that his inquiries into the matter had been fruitless, and that he has had no official notification of the existence of the contagion as is usual wherein infection is known to exist. He emphasizes strongly that the recently shipped cattle came directly from Illinois, and none from any port of this State.

The second newspaper paragraph would seem to have bearing upon pleuro-pneumonia amongst cattle some months ago, which must have escaped my observation at the time, though I endeavour constantly to note its appearance. I am under the impression that the maladies are, to some extent, kept *sub rosa*, perhaps in the interests of breeders or stock-drovers.

I have, &c.
(Signed) J. W. LAWFORD.

The Right Hon. Sir E. Thornton, K.C.B.,
&c. &c. &c.

Enclosure 3 in No. 40.

LETTER from the EDITOR of the "ÆGIS AND INTELLIGENCER," of HARFORD COUNTY, to the BRITISH CONSULATE, BALTIMORE.

MY DEAR SIR, Bel Air, M.D., March 19, 1880.

I DOUBT the correctness of the report that pleuro-pneumonia exists amongst Harford county cattle. No information of that character has been received at this Office.

I expect to meet the "Deer Creek Farmers Club" to-morrow, and will inquire particularly in relation to the matter among the members, all of whom are largely engaged in breeding and grazing cattle.

On Monday next I shall be prepared to give you some definite information, and will do so with pleasure.

(Signed) F. W. BAKER.

British Consulate, Baltimore, M.D.

Enclosure 4 in No. 40.

Extract from the Baltimore "Sun" of March 18, 1880.

(Special Despatch to the Baltimore "Sun.")

THE CATTLE DISEASE.—PROPOSED LEGISLATION.—THE PEARRE INVESTIGATION.

Annapolis, M.D., March 17.

Considerable uneasiness is felt on account of the reported existence of a disease said to be pleuro-pneumonia, in some of the counties of this State, especially in Harford. Two of the senators have cattle sick of the disease. One senator has it in a herd of very fine Alderneys, and a government agent has gone to inquire into the matter. A bill has been introduced authorising the Governor to take all necessary steps to suppress the disease should there be occasion in his judgment to do so; to issue proclamation, order quarantine or slaughter; to call on sheriffs of counties to help in the premises, and employ veterinary practitioners and fix their compensation; to examine all incoming cattle, and providing penalties for violations when the Governor has declared a necessity to exist for enforcing the regulation. The State treasury is to be placed at the disposal of the Governor for the necessary funds, and to pay for animals ordered to be slaughtered.

Extract from the Baltimore "Sun" of March 20, 1880.

MARYLAND STATE AFFAIRS.

(Correspondence of the Baltimore "Sun.")

Annapolis, M.D., March 19, 1880.

SUPPRESSION of CATTLE DISEASE.—TESTIMONY of JUDGE PEARRE.—FAVOURABLE REPORT on the SUNDAY LAW BILL.—The PROPOSED GAS COMPANY COMBINATION.—POLICE.—BRIBERY in ELECTIONS.—EMBEZZLEMENT of CARGOES.—BALTIMORE and NORTH-EASTERN RAILROAD, &c.

Cattle Disease.

Senator Williams, of Baltimore county, called the attention of the Senate to-day very plainly to the cattle disease and the need of prompt and stringent measures for its repression in this State. He said his barnyard in Harford county had been swept; President Stump, of the Senate, who is from Hartford county, has lost three; Senator Vanderford, from Carroll, says the disease is rife in his county; Governor Hamilton has received a letter from a veterinary surgeon stating that six or eight cases have been reported within three miles of Frederick city. The Secretary of State of Maryland has received a letter from the Board of Agriculture of Pennsylvania, written in December last, as follows:—

"Dear Sir,—I find my work in suppressing pleuro-pneumonia among horned stock, under a special commission from Governor Hoyt, very much increased by the introduction of stock from Maryland, and especially from Baltimore and the adjacent districts. This morning my surgeons report a herd of 30 infected by a cow from Baltimore. Several have died, and 12 more will probably have to be killed; the herd will be broken up and worse than lost. Is your State taking any action in this matter? If so, what, and with what result? Is co-operation possible, which will prevent this trouble? If so, how and with whom? Massachussetts, New York, New Jersey, and Pennsylvania are engaged in a shoulder-to-shoulder struggle with the infection, and in our case much of the trouble comes from Maryland. Will you please communicate with Governor Hoyt in the matter?

"Thos. J. Edge,
"Commissioner on Pleuro-Pneumonia."

This communication was answered negatively on the 20th of December by Secretary of State Hollyday, since which time nothing has been done by the Maryland authorities until Mr. Williams introduced the Bill, heretofore referred to, giving the Governor sweeping authority to stamp out the plague within our borders, which Bill is now pending in the Legislature. It has been since learned that the Pennsylvanian Commission is preparing to quarantine Maryland cattle, and place an embargo on shipments from Baltimore and other parts of our State.

Enclosure 5 in No. 40.

Letter from Sir E. Thornton to the Acting British Consul at Baltimore.

(No. 4.)

Sir, Washington, March 21, 1880.

With reference to your Despatches Nos. 7 and 8 of yesterday's date, I beg to say that I think it would be very advisable that you should make the most particular inquiries, 1, as to whether pleuro-pneumonia exists in some counties in Maryland, and which; and 2, whether the cattle shipped in the "Riversdale" and "Indus" really came direct from the West, or whether they may have been exposed to contagion at Baltimore, or may have been mixed with cattle from Maryland, also shipped on board of those steamers.

I have to request you to give me the best information you can obtain on these two points as soon as possible, and on its receipt I will decide whether it will be expedient for me to telegraph to England upon the subject.

I am, &c.
(Signed) E. Thornton.

T. W. Lawford, Esq.
&c. &c. &c.

No. 41.

LETTER from SIR E. THORNTON to the MARQUIS OF SALISBURY.

(Sanitary, No. 8.)

My Lord, Washington, March 29, 1880.

With reference to my Despatch, No. 6 of this series, and of the 23rd instant, I have the honour to enclose copy of a further Despatch and of its Enclosure, which I have received from the Acting Consul at Baltimore, relative to the existence of pleuro-pneumonia among cattle in the State of Maryland. It will be seen that Mr. Lawford doubts as to the truth of the reports upon the subject, and states that the cattle shipped on the steamers "Riversdale" and "Indus" came directly from the West, where no infection existed. Nos. 1 and 2.

But as he also says that they remained two days in Baltimore, and as there are reasons for suspecting that pleuro-pneumonia does exist amongst cattle in Maryland, I thought it more prudent to telegraph to your Lordship with respect to the cargoes of those two steamers, with a view to their being carefully inspected.

My suspicions that the disease does really exist in that State are strengthened by an article in the "Baltimore Sun" of the 27th instant, which I have the honour to enclose. No. 3. Your Lordship will perceive that, although a committee appointed by a farmers' club did not find the cattle on Senator Williams' farm affected by the disease, a veterinary surgeon, who visited it, declared that one of the cattle, which he received permission to slaughter, undoubtedly had pleuro-pneumonia. The fact that Senator Williams himself admitted that it was so, and proposed a Bill in the Maryland Legislature for the suppression of the disease, convinces me of its existence.

On the receipt of your Lordship's Despatch, No. 2 of this series, and of the 12th instant, I addressed to Mr. Hay, acting secretary in the absence of Mr. Evarts, a note, copy of which is enclosed, conveying the substance of the letter of the 28th ultimo, No. 4.

from the Veterinary Department of the Privy Council Office to your Lordships' Office, with regard to the slaughtering of cattle from the United States on their arrival in England, although they brought with them certificates of having been inspected on this side and declared free from disease.

I had two days before observed in the newspapers that the Treasury Department had modified its Order of February 1st, 1879, so that the inspection of cattle on being exported should be no longer compulsory.

The motive of this modification was stated to be that the cattle were slaughtered on their arrival in England, notwithstanding their being provided with certificates of health.

In my note to Mr. Hay, I have requested him to inform me whether this change has actually been made, for I have received no official notification of it.

I have, &c.
(Signed) EDWARD THORNTON.

The Marquis of Salisbury, K.G.
&c. &c. &c.

Enclosure 1 in No. 41.

Letter from the Acting British Consul at Baltimore to Sir E. Thornton.

(No. 8.)

Sir, Baltimore, March 24, 1880.

I have the honour to acknowledge the receipt of your Despatch, No. 4, of the 21st instant, having reference to cattle plague within this consular district.

I now have the honour to state that I have delayed this Despatch in the hope that I should hear from a Mr. Baker, of Harford county, who promised to write me on Monday. Up to the present time, however, I have not heard from him.

There is quite a division of sentiment as to whether pleuro-pneumonia really exists in any part of this State, and after careful inquiry I fail to find the report confirmed. The infection, if any exists, might be concealed in the interests of interested parties, as mentioned in my last Despatch upon the subject.

I have the honour to enclose herewith clippings from the "Sun" newspaper of this city upon the subject.

Upon careful inquiry I find that the cattle shipped hence by the steamers "Riversdale" and "Indus" came directly from the West—where no infection existed—and that both cargoes were detained at the city for two days only, prior to shipment, no disease having appeared amongst them.

I have, &c.
(Signed) J. W. Lawford.

The Right Hon. Sir E. Thornton, K.C.B.
&c. &c. &c.

Enclosure 2 in No. 41.

Extracts from Baltimore "Sun" of March 24, 1880.

The Pleuro-Pneumonia Question.

We print elsewhere another communication on the subject of pleuro-pneumonia among certain herds of cattle in Maryland. The writer takes issue with the doubt expressed by "Farmer" in our columns yesterday as to the existence of the disease in Maryland, and cites the fact that as late as Monday last two skilled veterinary surgeons found a marked case of the disease in another of the cattle on the farm of Senator Williams, in Harford county, and that the animal was at once slaughtered. At present it is admitted that the cases are very few in point of number, are widely separated, and the total extinction of the disease by slaughtering those who are suffering from it, and isolating the remainder of the herd, can be very easily effected. The extremes of temperature that cattle have passed through this season, the frequent rains to which they have been exposed, and perhaps want of care on the part of some of these who have had charge of them, have probably had much to do with these occasional outbreaks of pleuro-pneumonia. The fact that the disease rarely attacks native cattle, and has never yet appeared among the western herds, which constitute the great bulk of the cattle exported, would seem to indicate the limited range of the disease, except under circumstances where contact with it in its most contagious form cannot be avoided. Since the unusual prevalence of the disease in Massachusetts for six consecutive years after its first appearance in Mr. Chenery's herd, the outbreaks everywhere else have been sporadic, and in no instance known to us has assumed the form of an epidemic. Nevertheless the security of our herds can only be assured by vigilant watchfulness over them, and by the inexorable slaughter of every animal taken down by the disease. The suggestion made by "Farmer," yesterday to provide by law for an unpaid commission of five well-known farmers from different parts of the State, who shall be authorised to employ some eminent veterinary surgeon, and whose duty it shall be to make a thorough examination of diseased cattle, appears to us to be a good one, if such a commission would consent to give its services gratuitously, and especially if it were empowered to order the killing at once of every animal declared to be stricken with pleuro-pneumonia. We see no reason at present for alarm, provided proper steps are taken to examine and deal promptly with cattle alleged to be suffering with the disease. This can only be done by the enactment of a law to that end; and in justice to our farmers and cattle breeders, as well as to quiet any apprehensions in respect to the condition of cattle shipped from Baltimore abroad or sold into other States, such a law should be put on the statute book.

(For the "Sun.")

PLEURO-PNEUMONIA.

MESSRS. EDITORS,

THE writer on pleuro-pneumonia, signing himself "Farmer," in your issue of yesterday, makes a plain issue as to the existence of the disease in Maryland. Referring to the statements of Senators Williams, Stump, and Vanderford, that the contagion is present in the counties they represent, he says, unequivocally, "They are mistaken." It will be useful information to him who thus speaks, evidently without possessing knowledge or seeking to gain it, and perhaps to other sceptics, to know that Monday morning an inspection was made of the herd of cattle owned by Senator Williams, in Harford county, and not only were the proofs plain by external observation, but an animal was slaughtered of pleuro-pneumonia. This animal would have the spot, and disclosed the well-marked lesions undoubtedly furnished a thoroughly good point of contagion of all fresh cattle with which he might have come in contact, the diseased portion of the lung breaking down without even the protection of a cyst wall, and the pus unusually offensive. The examiners were skilled veterinary surgeons, one a member of the Royal Veterinary College of England and the other a graduate of the Veterinary College of Montreal. Further, I believe these gentlemen could find, if deemed necessary, on twelve hours' notice an acute case within the city limits, and I would undertake to pay the value of the animal, if on slaughtering it the disease was not found.—S.

Enclosure 3 in No. 41.

Extract from Baltimore "Sun" of March 27, 1880.

PLEURO-PNEUMONIA in MARYLAND.—The QUESTION of its EXISTENCE HERE DISCUSSED.—VIEWS of PRACTICAL MEN.—HOW IT MAY BE STAMPED OUT.

(Reported for the Baltimore "Sun.")

IN connexion with the Bill now before the State Legislature, introduced by Senator George H. Williams, of Baltimore county, and which has passed the Senate, looking to the prevention or spread of lung fever or pleuro-pneumonia among the cattle in this State, the "Belair Ægis and Intelligencer" has a long article. Mr. Williams, in presenting the Bill, said that his barnyard in Harford county had been swept by the disease, and it was also stated that Senator Stump, of the same county, had also lost three cattle from the same cause. The "Ægis" says, that "the subject was brought forward at a " meeting of the Deer Creek Farmers' Club, held last Saturday, at the residence of Mr. " R. Harris Archer. The members of this club own together at least a thousand head " of cattle. A thorough inquiry at the meeting established the fact that not a single " case of pleuro-pneumonia or other dangerous disease exists among the cattle owned

" by the members of the club, and none of the gentlemen present knew or had heard of " any cases of disease of any kind among stock in any part of the county.

" In view of the reports, however, the club appointed a committee, consisting of " Messrs. A. M. Fulford, Thomas A. Hayes, Dr. James M. Magraw, William Munnikhuysen, John Moores, and William F. Hayes, to investigate all the facts upon " which the reports were based. This committee ascertained, in the first place, that no " cattle have died on Senator Stump's farm. The committee state that all of Mr. Stump's " cattle are healthy, showing no signs of disease of any kind.

" The committee next visited Senator Williams' farm. There they found some cause " for apprehension, but nothing upon which to base a positive assertion that pleuro-" pneumonia existed among Mr. Williams's cattle. The committee were informed that " two years ago a steer was brought to the farm from Baltimore city. This animal did " not thrive as the other cattle, and died last summer. During last winter two cows " also died, but the manager of the farm expressed a decided belief that their death was " occasioned by old age. In February of the present year another cow was taken sick " and was killed. No postmortem examination was made of the steer or the cow, and " no one familiar with the symptoms of pleuro-pneumonia saw them. On Monday of the " present week a veterinary surgeon from Baltimore city visited Mr. Williams's farm, " and upon examing the cattle selected one, a yearling, and pronounced it unsound. He " could not positively pronounce it a case of pleuro-pneumonia without making a post-" mortem examination, and the animal was accordingly slaughtered. The lungs which " are the parts immediately affected, were taken by the veterinary to the city to be " subjected to microscopic examination. The remainder of Mr. Williams's cattle, 12 or " 14 in number, are to all appearances healthy and in fine condition. We have ourselves " made the most diligent inquiry among farmers from all parts of the county, and have " been unable to discover the existence of disease of any kind among the cattle anywhere in Harford county. Pleuro-pneumonia, if it exists here at all, is confined " exclusively to the farm of Mr. Williams."

In opposition to these assertions the veterinary surgeon who visited Senator William's farm states that he found three cattle with all the external evidence of pleuro-pneumonia. Permission was given to slaughter one of them, and it disclosed the well-marked lesions of pleuro-pneumonia. It would undoubtedly have furnished a thoroughly good point of contagion for all fresh cattle with which it came in contact, the diseased portion of the lung breaking down without even the protection of a cyst wall, and the pus being unusually offensive. He says that the symptoms were too plain to need any microscopic examination being made; that he found three cattle with all the external evidences of pneumonia. Permission was given to slaughter one of them, and the lungs were found to be badly affected. He states, that in company with another surgeon, who has had much experience of the disease, he has found in several parts of the State fully developed cases of the disease, some of them within the city limits of Baltimore. It is true that all of these cases are isolated ones, but they will form a centre from which, under favourable circumstances, the disease may be disseminated. The greatest danger will be found a few weeks from now, when cattle which have been confined to the stable all winter are turned out to grass. When once an animal has had the disease, even if it seems to recover, the seeds remain, and may under certain conditions be communicable. Besides the danger of infection from the animal itself, the car in which it is housed while sick can also become a medium for conveying the disease. The State board of agriculture of Pennsylvania have decided that all the cases of pneumonia in that State can be directly traced to infection from Maryland cattle, and they have called a meeting for Friday next, in Harrisburg, at which New Jersey will be represented, to take some action in the matter. They threaten that unless Maryland adopts some measures of prevention against the spread of the disease they will establish a 90 days' quarantine against all Maryland cattle, an action which would naturally injure the commercial interests of the State. Those who claim to be informed say, that if the disease should once past west of the Alleghany mountains no power could stop its spread, and that the only plan for Maryland to adopt is to kill all sick cattle and isolate the rest, and thus stamp out the disease in a few weeks. Pleuro-pneumonia is not an exaggerated type of pneumonia, but a separate and distinct disease. Neither is it indigenous, like hog cholera, but has been imported. Massachusetts succeeded by vigorous measures in stamping it out in 1859, and now that England has freed herself from it, she will guard against its reintroduction from any of the Atlantic States.

Enclosure 4 in No. 41.

LETTER from SIR E. THORNTON to MR. HAY.

SIR, Washington, March 27, 1880.

IN my note of the 24th of January last I had the honour to inform the Secretary of State that I would forward to the Marquis of Salisbury a copy of his note of the 23rd of that month, relating to the circular of the Treasury Department, dated the 1st February last, making the inspection of cattle intended for exportation compulsory before shipment, and inquiring whether Her Majesty's Government would be willing to make such a modification of the regulations upon the subject as would recognise certificates issued by the Customs authorities of the United States under the above mentioned circular as sufficient to exempt cattle inspected under its provisions from slaughter upon being landed.

His Lordship has now instructed me to state that he has been in correspondence upon this subject with the Lords of the Privy Council, who have reminded him that, in a letter of February 27, 1879, it was stated that their Lordships had carefully considered the orders issued by the Government of the United States in the circular of February 1st, 1879, for the inspection of cattle previous to exportation, but that they were aware from their own experience that no system of inspection at the port, however perfect, could give security against the introduction of pleuro-pneumonia. Their Lordships add that these views which they then expressed as to the impossibility of relying upon inspection, have been confirmed by the result of post-mortem examinations of cattle from American ports which have been landed at foreign animals wharves in the United Kingdom for slaughter.

It appears that, during 1879, there were 57 cargoes of American cattle in which pleuro-pneumonia was detected, the total number of animals in which disease was found to exist being 137, a number far in excess of that which has been received during any year from all other exporting countries put together.

Between January 1st and February 20th of the present year, 84 cattle affected with pleuro-pneumonia have been landed in the United Kingdom.

Under these circumstances it must be evident that the Lords of the Privy Council could not make such modification of the existing regulations on the subject as would recognise the certificates referred to in Mr. Evarts' note of the 23rd of January last, as sufficient to exempt American cattle from slaughter on being landed in the United Kingdom.

I have recently observed a statement in the newspapers that the order of the Treasury Department of the 1st of February 1879 has been modified, so that the inspection of cattle intended for export is no longer compulsory, and I should feel obliged if you would inform me whether an order to that effect has actually been issued by the Treasury Department.

I have, &c.
EDWARD THORNTON.

The Honourable John Hay.
&c. &c. &c.

(Sanitary, No. 3.) No. 42.

LETTER from the CONSUL-GENERAL at NEW YORK to the MARQUIS OF SALISBURY.

MY LORD, British Consulate General, New York, April 2, 1880.

I HAVE the honour to report to your Lordship that the sanitary condition of cattle in this consular district is practically the same as was mentioned in my last Despatch on the subject, Sanitary, No. 2, of the 8th ultimo.

I have, &c.
(Signed) E. M. ARCHIBALD.

Her Majesty's Principal Secretary of
State for Foreign Affairs.

(Sanitary, No. 10.) No. 43.

MY LORD, Washington, April 5, 1880.

WITH reference to my Despatch No. 8 of this series and the 29th ultimo, I have the honour to transmit herewith copies of the circular mentioned in that Despatch No. 1.

addressed by the United States Treasury Department to Collectors of Customs, by which it is ordered that henceforth the inspection of cattle exported from the United States will not be compulsory, but may be made upon the request of the shippers at their expense.

No. 2. I also enclose copies of the letter addressed by the Secretary of the Treasury to the Speaker of the House of Representatives, of which I transmitted a précis in my Despatch No. 3 of this series and of the 23rd February last. At page No. 7 of this document it will be seen that the Secretary of the Treasury admits that it is hardly just, whilst no effective measures are adopted in the United States to even systematically ascertain the extent of the cattle disease in this country, and much less to adopt efficient measures for its suppression to complain that the British Government adopts effective means to prevent the spread of the disease in the United Kingdom.

Nos. 3, 4, and 5. I also have the honour to transmit herewith a despatch addressed to your Lordship by the Acting Consul at Baltimore, enclosing copy of the Bill to prevent the spread of pleuro-pneumonia among the cattle of Maryland, to which I have alluded in previous despatches of this series.

It is stated in this morning's newspapers that this Bill was passed by both Houses of the Maryland Legislature before its adjournment, which took place on the 3rd instant.

I understand that the Secretary of the Treasury has within the last few days addressed a letter to Mr. Evarts, requesting that he would endeavour to obtain from Her Majesty's Government that cattle coming from the west of the Allegheny Mountains, going though Canada, and exported from Canadian ports, and from Portland and Boston in the United States, should be exempt from slaughter on arriving in England.

It is claimed, and I believe with truth, that pleuro-pneumonia does not exist amongst the cattle to the west of those mountains, and that, if they are transported direct from the Western States to the ports above mentioned, there will be no danger of infection. For my own part, I should be inclined to except Boston, for though of late no cattle disease has been reported from Massachusetts, there is no doubt that pleuro-pneumonia existed in that State some years ago, and that if immunity from slaughter were granted to cattle shipped at that port, an attempt might be made to send cattle from the States of New York to be shipped at Boston.

Mr. Evarts has not made any mention to me of the letter addressed to him upon this subject by the Secretary of the Treasury, and I therefore conclude that he will transmit instructions thereupon to the United States Minister in London.

I have, &c.
(Signed) EDWARD THORNTON.

The Marquis of Salisbury, K.G.
&c. &c. &c.

Enclosure 1 in No. 43.

Circular.

Exportation of Cattle to Great Britain.

1880.—Department No. 24, Secretary's Office.

Treasury Department, Washington, D. C., March 18, 1880.

To Collectors of Customs and others:

The Department's Circular Order of February 1, 1879, requiring the inspection of neat cattle, with reference to the question whether they were free from contagious diseases, is hereby revoked.

That order was issued upon information that an inspection and certificate by officers might prevent the United States from being included in the Order of the Government of Great Britain that cattle from certain countries must be slaughtered at the ports of that country within ten days from arrival. By an Order of the Privy Council of Great Britain cattle from the United States are now included in the above-named Order, and are required to be thus slaughtered.

Hereafter, therefore, inspection of cattle shipped from the ports of the United States will not be made compulsory, but inspection may be made upon request of the shippers and at their expense, under Order No. 139, of December 18, 1878, and the regulations and instructions now in force.

Collectors of Customs are requested to forward to this Department any information which they may be able to obtain of the presence of pleuro-pneumonia or other contagious or infectious diseases prevailing among neat cattle in their vicinity.

(By order) H. F. FRENCH,
Assistant Secretary.

Enclosure 2 in No. 43.

PLEURO-PNEUMONIA IN NEAT CATTLE.—Letter from THE SECRETARY OF THE TREASURY, relative to Pleuro-pneumonia or Lung-plague in Neat Cattle.

February 20, 1880.—Referred to the Committee on Agriculture.

March 4, 1880.—Recommitted to the Committee on Agriculture, and ordered to be printed.

Treasury Department, Office of the Secretary,
Washington, D. C., February 19, 1880.

Hon. Samuel J. Randall,
Speaker, House of Representatives.

SIR,

THE Department of the Treasury has been long embarrassed with several questions arising from the prevalence of the disease known as pleuro-pneumonia or lung-plague in neat cattle. These questions relate (1) to the extinction and prevention of the disease in the United States; (2) to our commerce with nations beyond the seas, especially with Great Britain; (3) to our trade in cattle with the Dominion of Canada.

With a view to such legislation as circumstances may seem to require, it seems proper at this time to submit to Congress some brief remarks upon the nature of the disease in question, the history of its prevalence in other countries and the United States, with a statement of the provisions of law now in force and of the various orders issued by this department relating to it, and some suggestions as to what measures may be properly enacted by Congress for the suppression and prevention of the disease.

Pleuro-pneumonia, or, as it is usually called in England, lung-plague, appears to be a malignant contagious lung fever in neat cattle, communicated by contagion from excretions from the bowels, kidneys, skin, and lung of other neat cattle. It has never originated in this country, all cases of it having been clearly traced to foreign sources.

Neat cattle are subject to pneumonia or common lung fever originating in them, as in man, from exposure to cold or similar causes, which is not contagious, and this disease is sometimes confounded with the true pleuro-pneumonia. A disease also prevails in Texas known as the "Texas fever," sometimes as the Spanish or splenic fever, which, although it is bad enough, is not in the strictest sense of the terms, either contagious or infectious. In Texas, it is said, cattle of all ages are afflicted with this malady in a somewhat latent and mild form. It is communicated to other cattle by feeding upon the ground over which the Texas cattle have been driven. This disease, though sometimes destructive, has no symptoms in common with pleuro-pneumonia, from which it may readily be distinguished.

The Disease in other Countries.

Pleuro-pneumonia is indigenous in Asia, and first appeared in Europe, into which it was introduced from Eastern Russia, at the end of the 17th century; until at the beginning of the present century outbreaks were occurring every few years over all parts of the continent.

According to the statement of Rev. Daniel Lindsey, a missionary in South Africa, before a legislative committee of Massachusetts in 1860, the disease was introduced into South Africa about 1854 by importation of a bull from Holland. The wealth of the inhabitants of that country consists in cattle and sheep, and herds of cattle numbering from five hundred to fifteen hundred wander over large tracts. The disease had spread through these herds in about six years over twelve hundred miles. The disease had become so general that there was no possibility of suppressing it by slaughter of the animals exposed, and inoculation was generally resorted to, and had brought it somewhat under subjection.

The disease first entered Holland in 1833. It was imported into Ireland, where the losses by the disease have been enormous, between 1839 and 1841, with some Dutch cattle, and appeared in Scotland in 1843. At about the same time it was committing great ravages in England. All the large towns containing dairy cows suffered, especially in the neighbourhood of the large cities—London, Manchester, Birmingham, and Liverpool. It is stated that the losses by pleuro-pneumonia during the past twenty-seven years have amounted to as much as ten millions of dollars per annum in the United Kingdom of Great Britain and Ireland. It is doubtful whether the disease has ever entirely disappeared in that country.

The disease was imported into Australia in 1858, by the importation of a short-horn English cow. It soon spread to the open country, and the mortality increased at an alarming rate. " Vigorous measures," says Dr. Law, " for its suppression were adopted; " thousands of infected or diseased cattle were slaughtered, but all proved of no avail. " Not only were the free roaming herds infected, but so many places were contaminated that it was soon perceived that help from this source was not to be expected. " Destroy a whole infected herd, and you still left the infection in the station, from " which, in its unfenced state, other herds could not be excluded, and where they were " certain to take in the germs of the malady. After enormous losses had been sustained " by the combined operations of the pest and poleaxe, it was concluded that the remedy " was worse than the disease, and the colonists reluctantly fell back on the expedient of " inoculation."

From England and Holland the disease was propagated in 1847 and 1848 in Sweden and Denmark.

The Disease in the United States.

The first notice of pleuro-pneumonia in the United States was in 1843, when a German cow imported direct from Europe and taken into a cattle shed in Brooklyn, N. Y., communicated the disease which has prevailed, more or less, in King's county, Long Island, ever since.

In 1847 the disease appeared in Delaware, imported in cattle from England by Mr. Thomas Richardson, and his whole stock, valued at $10,000, was slaughtered to prevent the spread of the disease.

The disease appeared in Delaware in 1861, and for three years prior to 1870 its ravages were quite extensive in the district of Columbia and adjacent parts of Maryland and Virginia.

In 1859 the disease was imported by Mr. Chenery, of Belmont, Mass., into that commonwealth. An extra session of the legislature was called to take measures to eradicate the disease, and a commission was appointed with full power to slaughter all cattle which had been exposed. After the slaughter of some 1,200 animals in addition to those which died of the disease, it was apparently exterminated. In 1863, however, Mr. Flint, secretary of the board of agriculture, in a letter to Governor Andrew, stated that the disease still existed in 12 or 15 towns in Massachusetts.

From the report of the Pennsylvania board of agriculture for September, October, and November, 1873, it appears that during that year 27 herds of cattle, including 408 animals, had been quarantined on account of the disease, and the greater part of them slaughtered. The disease seems to have been limited to six counties on the east of the Alleghenys; and was traced to cattle bought in the Baltimore, New York, and Philadelphia markets.

Cases of the disease have appeared, from time to time, in the State of New York, especially near the seaboard; but the legislature of that State, and the efficient action of its commissioners, have in every instance promptly prevented the spread of the disease by extermination of all cattle infected or exposed.

This statement as to the history of the disease in America is taken mainly from Professor Gamgee's report to the Commissioner of Agriculture, published in 1871.

A letter addressed by the Commissioner of Agriculture to the chairman of the Senate Committee on Agriculture, on the 14th of February 1879, states that the disease had prevailed during the previous summer in Burlington county, New Jersey, where it had also been prevalent for some years; that it had existed along the Potomac for a distance of about 45 miles in the years 1877 and 1878; that it had prevailed in Baltimore county, Maryland, for 12 or 15 years; that the report of the New Jersey board of agriculture for 1876 showed that 19 different herds of cattle suffered from this disease in Burlington county of that State during that year. In the same paper it is stated that Professor Gadsden of Philadelphia, who had recently made an examination of infected and deceased cattle on Long Island, wrote, under date of January 29, 1879, that the contagious disease known as pleuro-pneumonia then existed to a frightful extent among the cows near Brooklyn, Long Island.

It is important to observe that in all the reports to which reference has been made there is no indication whatever that a single case of pleuro-pneumonia has ever existed in any State west of the Allegheny Mountains. The importance of this point will be seen when we enter upon the discussion of the proper restrictions upon the trade in cattle between this country and the Dominion of Canada.

Prevention of the Disease.

Early in the year 1879 the department received information that pleuro-pneumonia had appeared in Hull and other parts of England. Hull is a port on the north-eastern coast of England, between which and New York a regular line of steamers plies, touching at Southampton, where cattle from the Channel Islands are taken on board and brought to the United States; and the department was strongly urged by the secretary of the New York Agricultural Society and others, to take precautions against the importation of infected cattle from that quarter. By a letter of February 10, 1879, from Mr. Packard, our consul at Liverpool, and by extracts from the London "Times," it appeared that pleuro-pneumonia had broken out in dairies near Liverpool, and that several cows had been then slaughtered by order of the Privy Council. It was in consequence of this information that an order of this department of February 26th, 1879, prohibiting the landing of cattle imported from England was issued.

In this connexion it is proper to allude to the statement, widely published in this country and Great Britain, that certain cattle shipped from Portland, Maine, early in the year 1879, by the "Ontario," had been found to be diseased with pleuro-pneumonia on their arrival at Liverpool, and were condemned to be slaughtered. It was stated in the London "Times" that of 197 cattle landed at Liverpool by the "Ontario," all had been slaughtered, and 13 of the number found to be infected. Upon inquiry it has been found that this shipment consisted of two herds, one said to have been from the West, and one from Canada. From the best evidence to be obtained, however, it is quite clear that these cattle were not infected with contagious pleuro-pneumonia, but only with common-pneumonia, which is not contagious.

In a letter from Andrew Smith, dated Ontario Veterinary College, Toronto, March 7, 1879, speaking of the cattle shipped by the steamer "Ontario," he says:

"Prof. Williams, of Edinburgh, who is justly recognized as one of the first pathologists of the day, had an opportunity to see over a hundred of these cattle slaughtered, and saw almost all of the deceased ones. He maintains that the cattle were only suffering from sporadic pneumonia, the result of exposure during a long and stormy voyage; but states that the changes in the lung tissues were very different from those which take place in contagious pleuro-pneumonia."

Mr. J. B. Sherman, superintendent of the Chicago Union Stock Yards, under date of February 4, 1879, says:

"The most important blow struck at the interests of this city, State, and the North-west, is the report in circulation relative to the prevalence of the cattle disease in the North-west; and these reports are absolutely false."

From the most reliable information that can be obtained it is safe to conclude that no case of contagious pleuro-pneumonia was carried from the Western States to Liverpool by the "Ontario;" and further, that no case of such disease has ever existed in the North-western States.

In considering what measures are necessary for the prevention of this disease, it is necessary always to bear in mind one fact with regard to it, namely, that it has a period of incubation, varying probably from 10 to 60 days. Animals exposed to the disease have sometimes developed symptoms of it in as short a period as 9 or 10 days; while others exposed in a like manner have developed no symptoms of the disease for nearly 6 days.

In a series of experiments carefully conducted in France in 1851, where diseased animals were distributed among healthy ones, symptoms of the disease were manifested by the healthy animals in from 9 to 57 days after exposure, about 20 per cent. of them escaping contagion altogether.

It does not follow, however, from the fact that symptoms of the disease first appeared in the healthy animals so long after their first exposure that the disease lay dormant in them during all that period, because it is evident that many of them may not have contracted the disease at all until they had been exposed to it during a long period. Again, in cases where cattle have been on shipboard fifty or sixty days, and the disease attracted no attention until the close of the voyage, it cannot be inferred that the disease had not developed itself long before, because it is evident that cattle would not be subject to such careful inspection on board ship as would lead to the detection of the early symptoms. Indeed, in the case of Chenery's cattle imported into Massachusetts from Holland, two of them were in such a condition of weakness that they were unable to walk when landed from the ship, and were carried on waggons some six or eight miles to their destination. By the Order of the Privy Council of England forty days seems to be regarded as the usual period of incubation of pleuro-pneumonia.

Inoculation as a Preventive.

Allusion has already been made to the practice of inoculation as a preventive of the pleuro-pneumonia as practised in South Africa and in Australia. There seems to be no doubt that all cattle are, in general, subject to the disease in question, but that inoculation is a preventive to the disease in its natural form.

Professor Gamgee gives some experiments made by Dr. Willems in Belgium in 1850–51. They are interesting as bearing upon several important points. In those experiments inoculation was introduced at the tip of the tail of the neat cattle, and it was found that symptoms of the disease were usually manifested, in the first group of observations, in from nine to eleven days. In another group of observations no symptoms of the disease were manifested until from twenty-two to twenty-seven days after the inoculation, thus indicating that there is no regular limit to the incubation of the disease.

Dr. Willems also, in the years 1851–52, performed various experiments on animals of different species with a view to ascertaining whether any animals except neat cattle could be infected by the disease. Among the animals subjected to these experiments were rabbits, pea-fowls, chickens, dogs, goats, sheep, and pigs. None of the animals thus treated showed any signs of the disease; and one of the conclusions of Dr. Willems is that the bovine race alone is infected by inoculation with this disease, while other animals of other races inoculated with the same liquid experienced no ill effects.

A recent statement has appeared in the newspapers that more than twenty thousand cattle have perished by pleuro-pneumonia in the island of Mauritius, and that more than a hundred deer had been infected by the same disease. It may be observed that no deer were included in the list of animals subjected to experiment by inoculation by Dr. Willems. While there is no sufficient evidence that other animals except neat cattle are subject to the pleuro-pneumonia, it is evident that there is great danger that the disease may be conveyed mechanically in the fleece of sheep, as it is known to be conveyed in the bedding, and by the executions of neat cattle; and as it also communicated by the stalls and cars in which diseased cattle have been kept. It is safe to conclude that this disease is as contagious and infectious as small-pox, and transmissible in the same manner among animals as that disease is among mankind.

From the experiments of Dr. Willems and from the extensive practice of inoculation in South Africa and Australia, it is fair to conclude that inoculation is a preventive of the disease in its natural form; but the objections to it are so many and so grave, that the practice of it cannot be advised in this country under present conditions.

"The great objection to inoculation," says a writer already quoted, "is that it can "only be practised at the expense of a universal diffusion of the poison, and of its "maintenance in a state of constant activity and growth. With such a universal "diffusion of the virus, the stock-owners are virtually debarred from introducing any "new stock for improving the native breeds, or infusing new vigor or stamina, inasmuch "as such new arrivals would almost certainly fall early victims to the plague. Australia, "therefore, now suffers from the permanent incubus of the lung plague, and can only "import high class of cattle at great risk."

In dairy regions, where the lands are inclosed and cattle are kept under daily supervision, it might be possible to make use of inoculation as the preventive, but not where the disease has broken over all bounds, and become general in a considerable section of country. Such, however, is not the case, and it is hoped never will be in any part of the United States; and inoculation is not to be regarded as any part of the remedy at present to be considered.

Value of Neat Cattle and of the Cattle Trade.

It is estimated that there were in the United States, 1879, something more than 33,000,000 of neat cattle, valued at more than $586,000,000. It is difficult to estimate the loss that would ensue by the prevalence of the pleuro-pneumonia throughout our country. It would evidently far exceed the present value of all the neat cattle of the country, because it would impair the productive capacity of the country for all future time.

In the article already cited, Dr. Law says:

"Thus England, with her 6,000,000 head of cattle, has lost in deaths alone from lung fever in the course of forty years over $500,000,000. We, therefore, with our 28,000,000 should lose not less than $2,000,000,000 in the same length of time, allowing still a wide margin for the lower average value per head in America; and this terrible drain is for deaths alone, without counting all the expenses of deteriorated health in the survivors, of produce lost, of loss of progeny, of loss of fodder no longer safe to feed to cattle, of diminished harvests for lack of cultivation and manure, of quarantine and separate attendants whenever new stock is brought on a farm, of cleansing and disinfection of sheds and buildings, &c., which become absolutely essential in the circumstances.

In this view the general introduction of this disease thoughout our country would impose a loss in forty years of an amount equal to that of the present national debt. With this danger imminent at the present time, it is the duty of every department of the Government to exercise its powers in the prevention of so great a national calamity.

In this connexion it may be proper to give a statement showing the improvement of our trade in neat cattle with other nations, and to call attention to its rapid increase within the past few years. The exports of horned cattle during the first five months of the current fiscal year, ending June 30, 1879, amounted to $4,414,000—being $517,182 in excess of the value of the same during the entire preceding year. Of the cattle exported in 1878, about 62 per cent. went to Great Britain.

The following table gives the number and value of cattle exported from this country from 1873 to 1880.

It is interesting to observe that notwithstanding the restrictions upon the introduction of cattle from the United States into Great Britain, the number and value of cattle thus introduced during the fiscal year ending June 30, 1879, were nearly three times as great as of those introduced in the fiscal year 1878.

STATEMENT showing the NUMBER and VALUE of CATTLE EXPORTED from the UNITED STATES to the UNITED KINGDOM and all other COUNTRIES from July 1, 1872, to December 31, 1879.

Fiscal years ended June 30.	United Kingdom.		All other countries.		Total.	
	Number.	Dollars.	Number.	Dollars.	Number.	Dollars.
1873 - - - -	- -	- -	35,455	695,957	35,455	695,967
1874 - - - -	123	113,800	55,944	1,037,057	56,067	1,150,857
1875 - - - -	110	73,000	57,101	1,030,085	57,211	1,103,085
1876 - - - -	244	31,220	51,349	1,079,483	51,593	1,110,703
1877 - - - -	5,091	546,829	44,910	1,046,251	50,001	1,593,080
1878 - - - -	24,982	2,408,843	55,058	1,487,975	80,040	3,896,818
1879 - - - -	71,794	6,616,114	64,926	1,763,086	136,720	8,379,200
Six months ending Dec. 31, 1879 -	45,556	4,144,304	32,020	827,028	77,576	4,971,332

(Signed) JOSEPH NIMMO, Junior,
Chief of Bureau.

Treasury Department, Bureau of Statistics,
February 13, 1880.

These figures by no means show the full value of our unobstructed trade in neat cattle with foreign nations. Great Britain has suffered so much and so long from the pleuro-pneumonia that she is compelled to adopt stringent measures to prevent its introduction into her territory. Those measures consist at present of orders that cattle shall be slaughtered at or near her principal ports of entry. The British Government has established at the ports "lairs" where animals can be safely housed, and slaughter-pens sufficiently extensive to accommodate the business.

Great complaints have been made by American exporters of cattle to England of these restrictions on the part of the British Government. It is hardly just, however, while no effective measures are adopted in the United States to even systematically ascertain the extent of the cattle disease in this country, and much less to adopt efficient measures for its suppression, to complain that the British Government adopts effective means to prevent the spread of the disease in that country.

The principal export of cattle to Great Britain has been heretofore and perhaps will continue to be of fatted cattle intended for immediate slaughter, and the injury to this branch of traffic by the restrictions referred to is by no means fatal. It is believed, however, that in future an extensive trade in what are known as store or lean cattle, intended to be driven inland in Great Britain and there fattened for the market, will naturally grow up if the traffic be unrestricted by such orders as now exist for the slaughter of cattle at the ports of importation. The British Government, as well as our own, is deeply interested in this question and appears to be disposed to encourage the the trade in question so far as may be consistent with its own safety. Indeed, much correspondence has occurred between the British Minister and the Department of State upon this subject.

In a letter of January 24, 1880, referring to the correspondence with regard to the recognition of certificates issued by customs officers of the United States, which has been referred to this department, the British Minister says:

"I venture to hope, however, in the interest both of Great Britain and of the United State, that Congress will, in its wisdom, pass such laws as may have the effect of obliterating the disease in this country, even if it be at the expense of a considerable outlay, though but a trifle compared with the loss of property which would arise from the continuance and spread of this destructive disease."

Existing Laws and Regulations on the Subject.

The only authority which any of the departments of this Government has to deal with the disease in question, is found in sections 2493, 2494, 2495, which are as follows:

"Sec. 2493. The importation of neat cattle and the hides of neat cattle from any foreign country into the United States is prohibited: Provided, that the operation of this section shall be suspended as to any foreign country or countries, or any parts of such country or countries, whenever the Secretary of the Treasury shall officially determine, and give public notice thereof, that such importation will not tend to the introduction or spread of contagious or infectious diseases among the cattle of the United States; and the Secretary of the Treasury is hereby authorised and empowered, and it shall be his duty to make all necessary orders and regulations to carry this law into effect, or to suspend the same as therein provided, and to send copies thereof to the proper officers in the United States, and to such officers or agents of the United States in foreign countries as he shall judge necessary."

"Sec. 2494. The President of the United States, whenever in his judgment the importation of neat cattle and the hides of neat cattle may be made without danger of the introduction or spread of infectious or contagious disease among the cattle of the United States, may, by proclamation, declare the provisions of the preceding section to be inoperative, and the same shall be afterward inoperative and of no effect from and after thirty days from the date of said proclamation."

"Sec. 2495. Any person convicted of a wilful violation of any of the provisions of the two preceding sections shall be fined not exceeding five hundred dollars, or imprisoned not exceeding one year, or both, in the discretion of the court."

Under these provisions it seems to have been assumed that the law conferred no authority upon the Secretary of the Treasury to make special orders in particular cases, or to impose any conditions whatever. Upon a critical examination of the provisions in question, under the present Secretary, it has been held that the power to suspend the prohibition of importation implies the power to suspend it upon proper conditions imposed by regulation; and it is under this construction that the annexed order of the department providing for a quarantine for cattle imported from foreign countries was issued. It will be seen by the explanation which will now be given of the orders issued by this department, that the Secretary has exercised to the fullest extent all authority vested in him by law for the suppression of pleuro-pneumonia.

On the 18th of December 1878, a despatch was received by cable from Liverpool, through the Department of State, stating that unless cattle shipped from the United States had a government health certificate when embarked, they would probably be slaughtered on landing; and suggesting that Minister Welch be cabled of an assurance that veterinary officers would be appointed at the seaports. Upon receipt of this despatch the department issued an order to collectors of customs and others, authorising the inspection of neat cattle proposed to be shipped to Great Britain, and the issuing of a certificate that such cattle were free from disease.

A copy of this order, marked A., is herewith transmitted.

On the 1st of February 1879, a second order was issued modifying the order of December 18, 1878, and making inspection at the ports, which before had been voluntary only, compulsory in all cases. By the same order collectors of customs were requested to promptly forward to this department any information which they might be able to obtain of the presence of contagious or infectious diseases prevailing among live animals in their vicinity.

A copy of this order, marked B., is transmitted.

On the 26th of February 1879, an order addressed to collectors of customs was issued, stating that the department had learned that pleuro-pneumonia had recently been found to exist among neat cattle at Hull, England, and prohibiting the landing of neat cattle from England at ports of the United States until further orders.

A copy of this order, marked C., is transmitted.

This order was issued partly in consequence of a letter from the secretary of the New York Agricultural Society, addressed to the Secretary of the Treasury, calling attention to the fact that cattle from the Jersey Islands were brought to the United States frequently and in considerable numbers, by steamers sailing from the port of Hull, touching at Southampton, where they received cattle from the Channel Islands; and epecially that the steamer "Lepanto" was to arrive from England at New York, bringing a herd of cattle from Southampton to be sold at auction in New York.

The department had also been informed that two herds of cattle, one being from the United States and the other from Canada, shipped from Portland by the "Ontario," had been found to be diseased with pleuro-pneumonia on their arrival; and, further, that the Dominion of Canada by the order of February 6, 1879, had prohibited the importation of cattle into that dominion from the United States for a period of three months. This order, by an order of October 14, 1879, was made perpetual until dissolved, and is now in force. A letter had also been received from Dr. Law, of the Brooklyn Board of Health, urging either the absolute prohibition of the importation of cattle from Europe, or of placing them in quarantine, as absolutely necessary for the protection of our country from the disease in question.

It was understood that there were companies in Philadelphia and New York, regularly engaged in importing cattle from the Channel Islands for sale at auction in those cities; and it was ascertained that by these auction sales cattle were distributed throughout all parts of the country.

On the 19th of July, 1879, the order prohibiting the importation of neat cattle from England was revoked, with the proviso—

"That all neat cattle from any part of Europe arriving at ports of the United States shall be kept in quarantine for not less than ninety days, under direction of the customs officers, and at the expense of the parties interested, except when State or Municipal laws provide for a quarantine of such cattle, and in such cases collectors will permit the proper officers to quarantine them in such manner as the State or municipal authorities require."

The department in that order reserved the right to consider special cases, and to decide whether in such cases cattle might be delivered at a period shorter than ninety days. The reasons for issuing this order are obvious enough without explanation. The reason why an order for quarantine was not issued at an earlier period is that, as above stated, the provisions of the statute before cited had been construed to allow only the free importation or the utter prohibition of the importation of cattle from abroad. Under urgent representations from several quarters, the question was reconsidered, and upon consultation with leading officers of other departments, the conclusion was adopted that the Secretary, under the provisions referred to, had, under the authority to prohibit or admit at his pleasure, the power to impose conditions upon the importation of cattle in the nature of quarantine regulations. The correctness of this construction may possibly admit of some doubt; and if Congress shall be of opinion that the Secretary has not the power to establish quarantine regulations, it is respectfully submitted that such authority should be given to him or some other department of the Government to do so.

A copy of this order, marked D, is transmitted.

On the 27th of December 1879, this department published an order modifying the order of July 19, 1879 [Exhibit D.], and requiring that in all cases a quarantine of not less than ninety days shall be enforced, including any term during which cattle shall be quarantined under State or municipal authority; and providing that cattle from Australia and New Zealand shall be regarded as embraced in the order of July 19, 1879.

It was found that under the order of July 19, which allowed State and municipal authorities to quarantine cattle according to their own regulations, a much shorter period than ninety days was often required. Under present regulations, a quarantine of ninety days is required in all cases.

On the 3rd of November 1879, the department issued the following order:—

"*To Collectors and other Officers of Customs:*

"To aid in preventing the introduction in the United States of contagious diseases among cattle, it is hereby ordered, that, in pursuance of the authority contained in section 2493 of the Revised Statutes, the importation of neat cattle from the Dominion of Canada is prohibited until otherwise directed.

"This order will take effect on the first of December next."

A copy of this order, marked F., is transmitted.

It became necessary to issue this order, because it was found that after the publication of the order of July 19, imposing quarantine upon cattle imported directly into the United States, cattle were imported into Canadian Ports and driven across the border into the United States, thus avoiding any quarantine whatever.

It may be proper to state in this connexion that this department has been notified that, by an order of the privy council of Canada, issued on the 6th of December 1879, a quarantine of foreign cattle imported into the Dominion of Canada of ninety days has been established. If it shall be found upon further inquiry, that our opinion that no pleuro-pneumonia exists in Canada is correct, and that a quarantine at the ports of Canada is rigidly enforced, it is in contemplation by this department to rescind the order prohibiting the importation of cattle from Canada into the United States.

It is hoped that the purpose of this Government to dispense with all restrictions upon the importation of cattle from Canada into the United States will be met with a corresponding purpose on the part of the Government of Canada to dispense with all restrictions upon importations of cattle from the United States into that dominion not absolutely necessary to its own protection.

This department is fully satisfied from reports under its order of February 1, 1879 [Exhibit B.], and from other correspondence, and from careful inquiry of members of Congress and others, that contagious pleuro-pneumonia has never existed in any of our territory west of the Alleghany Mountains, and that the importation of cattle from the Western States, through Buffalo and points west of that port, into the Dominion of Canada can be attended with no danger of carrying infection into the Dominion of Canada.

It is hoped that arrangements may be made that the great line of traffic through the posts of Buffalo, Detroit, and Port Huron, over the Grand Trunk Railway through Canada, may be resumed. Extensive cattle yards are in existence at Sarnia, the western terminus of the Grand Trunk Railway, from which cattle crossing from Port Huron were shipped upon that railway for transportation to the Atlantic coast for shipment abroad. That traffic is now entirely suspended by the Canadian order of non-importation. It is of great importance to the United States, to the Dominion of Canada, and also to Great Britain. If proper regulations can be established by Congress, or otherwise, for security against infection at or near the ports of exportation, it is believed that the British Government will gladly rescind the order which now requires the immediate slaughter of cattle imported from the United States into Great Britain at the ports of importation, as already suggested.

With the removal of those restrictions a large exportation of store cattle from the United States to Great Britain might be made to the advantage of both countries.

Althought many complaints were at first made of the order compelling immediate slaughter of cattle imported from the United States into Great Britain, a careful consideration of the position of both countries, with regard to the disease in question, leads to the conclusion that the order was made in perfect good faith to prevent importation of the disease, and not with any view to embarrass the traffic in neat cattle between the countries. The supposed importation of the pleuro-pneumonia by the "Ontario," and the reports of the existence of the disease in several of the Atlantic States, furnished reasonable ground for the action of the British Government, and it is not doubted that the Government will be as ready to rescind the restrictions upon the traffic as it was to impose them, whenever it is convinced that it may do so without danger of introducing the much-dreaded disease.

It is all important, not only with reference to our own protection, but to our commerce with Great Britain in neat cattle, that effectual measures shall be taken by our own Government to guard in general against the spread of the disease in this country, and in particular against its possible introduction into Great Britain, through the shipment of cattle from our own ports.

Measures to Prevent and Suppress the Disease.

Among the measures suggested to prevent the spread of the pleuro-pneumonia, isolation of the infected cattle is naturally suggested. This method, however, has been, and no doubt will be found to be entirely impracticable. The disease, as we have seen, is readily transmissible, not only by contact with the diseased animals, but by contact with buildings, hay, bedding, or excretions of any kind which have been in contact with diseased animals. Neat cattle are short lived, and when once infected by the disease in question, even if they recover, are of very small value either for breeding, for fattening, or for labour. Although a large percentage of the cattle diseased may apparently recover, yet, upon dissection, the lungs will be found to be seriously affected, so that it may be fairly said that cattle once infected with the disease are worthless for any purpose.

Added to this, isolation is very expensive, is attended with great risk to the neighbourhood, and the infected herd must be always suspected, and therefore unsaleable. In no view can the isolation of the cattle be recommended further than for the mere purpose of ascertaining definitely whether or not the disease actually exists.

Inoculation is, as has been before stated, another method practised in some countries to prevent the spread of the disease; but this has never been employed except in countries where the disease had broken through all restraint, and as a last resort to preserve sound cattle from the general infection which surrounds them. Besides the expense and inconvenience of the practice, it is often attended with the mutilation of the cattle by the loss of their tails or otherwise, and sometimes by the loss of their lives. It is not to be thought of as a remedy under any conditions such as exist at the present time in this country.

The only effectual method of eradicating the disease is by prompt slaughter of all infected and exposed cattle. By this method, energetically administered, the disease has been thoroughly stamped out in several places in Massachusetts, New York, Pennsylvania, and other States. To effect this, however, prompt and energetic measures are requisite. Several States have adopted such measures, and are ready to prevent, to attack, and exterminate the disease wherever it may appear within their borders. Most States, however, have adopted no such measures; and it seems absolutely necessary that some measures should be adopted by the general Government to prevent the prevalence of a disease, which, as we have seen, would amount to a national calamity. It is for Congress, and not for this department, to devise the measures necessary for this purpose. It may not be improper, however, to make some general suggestions upon the subject for the consideration of Congress.

The legislature of Massachusetts has recently sent to Congress a memorial requesting prompt action for the prevention and suppression of this disease; and from all quarters a cry is heard that it is time that the general Government should intervene in the matter.

The most obvious method of meeting the emergency is, perhaps, the appointment of a veterinary sanitary commission, whose duty it shall be to promptly investigate all reported cases of pleuro-pneumonia in any part of the country, to collect information with regard to the disease from all parts of the world, and to report the results of their investigation to some department of the Government for publication.

It would be necessary that such commission should be composed, principally at least, of veterinary surgeons or experts in the diseases of cattle. The commission might be small, consisting of from three to seven members, with authority to employ assistants or agents, who should be responsible directly to the commission. From such a commission, even with no greater powers than have been above indicated, much good might result. Owners of suspected herds and their neighbours would at once be informed whether the contagious disease was really present or not. If it were found to exist State and municipal authorities might be invoked for its suppression. If found not to exist, publication of that fact would be of very great value, not only to the suspected neighbourhood, but to the country and world in general.

Going a step further, Government might invest such commission with authority, in proper occasions, to aid municipal and State authorities in the suppression of the disease, and, by means of appropriation for the purpose, grant proper indemnity to the owners of cattle condemned to slaughter. Such proceedings would be in a close analogy with the methods adopted for the prevention and suppression of the yellow fever in the Acts establishing the Board of Health.

Under the provision found in the third section of the Act of June 2, 1879, entitled "An Act to prevent introduction of Contagious and Infectious Diseases into the United States," it is provided that—

"The National Board of Health shall co-operate with, and, so far as it lawfully may aid State and municipal boards of health in the execution and enforcement of the rules and regulations of such boards to prevent the introduction of infectious or contagious diseases into the United States from foreign countries, and into one State from another."

It is understood that this Act does not apply to diseases in animals.

Under this provision large amounts of the appropriation contained in the Act have been expended in co-operation with the authorities of several cities and States infected or threatened with infection by yellow fever; and it is not doubted that, through similar agencies, appropriations by Congress might be properly and effectually used for the prevention and suppression of pleuro-pneumonia among cattle.

As suggested by the British minister, the most obvious method of dealing with the disease would be by the appointment of a commission of some kind, with full power to prevent and eradicate the disease, in any manner they think proper, in any part of the territory of the United States, such power as is exercised by the Privy Council of Great Britain. Without expressing any opinion whether, under the power to regulate commerce, Congress has authority to send its agents into the States and destroy, upon the judgment of a commission, herds belonging to citizens which may be found to be dangerous to inter-State or national commerce, it is somewhat doubtful whether measures apparently so arbitrary would meet with hearty co-operation from State or municipal authorities.

The disease is not in existence in any of our Western States or territories. Indeed, it has existed and is known in only a few States of the Union, and the propriety of so energetic a movement on the part of the general Government might not be appreciated in those States where the disease has not been known. Some scheme for the prevention and prompt eradication of the disease seems to be demanded, and it is for Congress to define the limits both of policy and legality in its enactment.

Inspection of cattle upon railway trains on our great line of transportation has been suggested as a precaution against the conveyance of the disease. The objections to this proposition are based upon the fact that contagious pleuro-pneumonia is not indigenous to this country, that it has never existed in our Western States, whence cattle found upon such lines of transportation are brought, and that therefore such inspection is unnecessary.

Again, the disease has an incubation of from 9 to 60 days, during which the seeds of the disease would not be obvious to any inspector, however skilled. The interest of all shippers of cattle is clearly against the shipment of cattle infected with this disease. The delay of trains for such inspection would be expensive, and would be a great obstruction to business. Such inspection, as a general proposition is not recommended, while there is no practical objection to the inspection of cattle by authorized commissioners in particular cases where the disease is reported to exist.

Conclusions.

Having thus given a brief sketch of the history and character of the disease and a statement of existing laws the orders of this department under them, with some suggestions as to the effect of the disease upon our commerce with other nations, and with some remarks as to appropriate legislation by Congress on the subject, it may be convenient to state in this place, in the form of propositions, the conclusions at which this department has arrived. They are as follows:

1. Pleuro-pneumonia is a contagious infectious lung-fever in neat cattle, as readily communicated among them as small-pox among mankind, not only by actual contact, but by excretions of all kinds.
2. In this country it has never developed *de novo*, but has always been introduced by contagion.
3. It may be prevented by inoculation; but that remedy is not to be thought of in this country under present conditions.
4. It has a period of incubation of from 9 to 60 days, usually not exceeding 40, and its symptoms, when developed, are easily distinguishable by experts from those of other diseases.
5. The only proper method of suppressing the disease in the United States is by the destruction of all diseased or exposed cattle, and a thorough purification of buildings where they have been kept.
6. No contagious pleuro-pneumonia now exists or has ever existed in any State west of the Alleghany Mountains.
7. It does not now exist in the United States, on or near the boundary of the Dominion of Canada, and that it does not now exist in that dominion.
8. The disease now exists only in the eastern part of New York, in New Jersey, Pennsylvania, and perhaps in parts of Maryland, Virginia, and the district of Columbia.
9. The general course of traffic in cattle is from the west to the east. Only a few, and those of blood stock of great value, pass westward or into Canada from the east.
10. At the present time with ordinary care, cattle may pass from the Western States which almost exclusively furnish cattle for exportation into Canada, and through Canada, Portland, and Boston to foreign ports, without danger of infection.

11. With proper restrictions against contact with other cattle near the seaboard, cattle may pass from the Western States to the ports of New York, Philadelphia, and Baltimore for exportation, without danger of infection.

12. State and municipal regulations are not to be relied upon to prevent the importation and spread of the disease, or to effect its extirpation.

13. Stringent quarantine regulations are essential to the protection of this country against its introduction.

14. A veterinary sanitary commission whose duty it shall be to investigate all reports of the existence of the disease, to collect information respecting it, and report to some department for publication, is essential to efficient action on the subject.

15. Authority in such commission to co-operate with State and municipal authorities in preventing and eradicating the disease by supplying money out of appropriations by Congress for the purpose would be effective, and is in accordance with the Acts of Congress in reference to the National Board of Health.

16. The authority in such board to promptly isolate and slaughter infected and diseased cattle wherever found, and to award compensation to the owners, would be an effective agency to extirpate the disease. It is for Congress to consider the policy and legality of conferring such power.

Very respectfully,
(Signed) John Sherman,
Secretary.

Exhibit A.

Circular.—*Exportation of Cattle to Great Britain.*

1878—Department No. 139, Secretary's Office.

To Collectors of Customs and others:

Treasury Department, Washington, D. C., December 18, 1878.

The following Despatch has been received by cable, through the Department of State, from Liverpool:

"Unless cattle shipped from United States have Government health certificates when embarked, slaughter probably compulsory on landing paralyzing trade. Can you cable Welsh assurance appointment veterinary officers at sea ports."

You are authorised to cause an inspection to be made of all neat cattle proposed to be shipped from your port to Great Britain, and to issue your certificate that such cattle as shall be shipped are free from all disease, and that there is no known disease in cattle at your port or in its neighbourhood.

In States in which there are officers authorised by law to examine into the diseases of cattle, the collector may avail himself of their services, as the basis of his action, at the expense of the shippers.

(By Order.)

Very respectfully,
(Signed) H. F. French,
Assistant Secretary.

Exhibit B.

Circular.—*Information in regard to Cattle Diseases.*

1879.—Department No. 23, Secretary's Office.

To the Collectors of Customs and others:

Treasury Department, Washington, D. C., February 1, 1879.

By department's circular of December 18, 1878, it was directed that live cattle shipped from the ports various of the United States might be examined with reference to the question whether they were free from contagious diseases, and that if found to be free from such diseases, a certificate to that effect should be given.

By that circular such inspection was not made compulsory, but the certificate was to be issued only upon the application of parties interested.

As the export trade in live cattle from the United States is of vital importance to large interests, every precaution should be taken to guard against the shipment of diseased animals abroad, and such a guarantee given as will satisfy foreign countries, especially Great Britain, that no risk will ensue from such shipments of communicating contagious or infectious diseases to the animals in foreign countries by shipments from the United States.

Collectors of customs are, therefore, instructed that in no case will live animals be permitted to be shipped from their respective ports until after an inspection of the animals with reference to their freedom from disease, and the issuance of a certificate showing that they are free from the class of diseases mentioned.

Notice of rejected cattle should be promptly given to this department.

In order that this department may be fully informed in regard to such diseases in any part of the United States, collectors of customs are requested to promptly forward to this department any information which they may be able to obtain of the presence of contagious or infectious diseases prevailing among live animals in their vicinity.

It is probable that if the disease prevails to any considerable extent it will be noticed in the local press, and collectors are requested to send copies of any such notices to this department for its information.

(Signed) JOHN SHERMAN,
Secretary.

EXHIBIT C.

Treasury Department, Office of the Secretary,
Washington, D. C., February 26, 1879.

SIR,

THE department learns that the disease called pleuro-pneumonia has recently broken out or been found to exist among neat cattle at Hull, England, and you are hereby instructed not to permit the landing of neat cattle at your port from England, until otherwise instructed, this order being based upon section 2493 of the Revised Statutes.

Very respectfully,
(Signed) H. F. FRENCH,
Assistant Secretary.

Collector of Customs, New York.

EXHIBIT D.

CIRCULAR.—*Importation of Neat Cattle.*

1879.—Department No. 126, Secretary's Office.
To Collectors of Customs and others:

Treasury Department, Washington, D. C., July 1879.

The order of the 26th of February last, prohibiting the importation of neat cattle from England, is revoked.

By authority of section 2493 of the Revised Statutes, it is ordered: That the operation of the first clause of that section, which prohibits the importation of neat cattle from any foreign county into the United States, be suspended as to all ports of Europe, the Secretary having officially determined that such importation will not tend to the introduction or spread of contagious or infectious diseases among the cattle of the United States. Provided, that all neat cattle from any port of Europe arriving at any port of the United States, shall be kept in quarantine for not less than 90 days, under the direction of the customs officers, and at the expense of the parties interested, except when State or municipal laws provide for the quarantine of such cattle, and in such cases collectors will permit the proper officers to quarantine them in such manner as the State or municipal authorities require.

The department will, upon application, consider special cases where it may be claimed during such quarantine, that the cattle came from entirely healthy localities direct to the United States, and will decide in such cases whether they may be delivered at a period shorter than the 90 days before mentioned.

In any case where, during quarantine not under control of State or municipal authorities, the animals shall exhibit evidence of infectious or contagious disease, the facts will be reported to the department for instructions.

(Signed) H. F. FRENCH,
Acting Secretary.

EXHIBIT F.

CIRCULAR.—*Prohibiting Importation of Neat Cattle from Canada.*

1879.—Department No. 160, Secretary's Office.

Treasury Department, Office of the Secretary,
Washington, D. C., November 3, 1879.

To Collectors and other Officers of the Customs:

To aid in preventing the introduction into the United States of contagious diseases among cattle, it is hereby ordered that, in pursuance of the authority contained in section 2493 of the Revised Statutes, the importation of neat cattle from the Dominion of Canada is prohibited until otherwise directed.

This order will take effect on the 1st of December next.

By order of the Secretary.

H. F. FRENCH,
Assistant Secretary.

EXHIBIT E.

CIRCULAR.—*Importation of Neat Cattle.*

1879.—Department No. 179, Secretary's Office.

Treasury Department Washington, D. C., December 27, 1879.

To Collectors of Customs and others:

The circular published in Decision No. 4104, of July 19, 1879, provided as follows:

"That all neat cattle from any port of Europe, arriving at any port of the United States, shall be kept in quarantine for not less than ninety days, under the direction of the customs officers, and at the expense of the parties interested, except when State or municipal laws provide for the quarantine of such cattle, and in such cases collectors will permit the proper officers to quarantine them in such manner as the State or municipal authorities require."

Collectors of Customs are hereby instructed that in all cases a quarantine of not less than 90 days shall be enforced, including any term during which such cattle shall be quarantined under State or municipal authority.

Cattle from Australia and New Zealand will be regarded as embraced within Order No. 4104, as hereby amended.

H. F. FRENCH,
Assistant Secretary.

Enclosure 3 in No. 43.

LETTER from the ACTING BRITISH CONSUL at BALTIMORE to the MARQUIS OF SALISBURY.

Sanitary, No. 3.

MY LORD MARQUIS, Baltimore, April 1, 1880.

WITH reference to my Despatch, Sanitary No. 2 of the 1st ultimo, I have the honour to inform your Lordship that during the past month there were some rumours of the existence of cattle plague in some of the counties of the State of Maryland, and that I at once took measures to ascertain the truth of the reported infection. With a view to the prevention of the landing of the live-stock cargoes of two British steamers, which cleared hence for London and Bristol, I communicated all the facts of which I was informed to the Right Honourable Sir Edward Thornton, Her Majesty's Minister at Washington, asking that I would be instructed to telegraph to your Lordship, if he thought the facts would warrant that course.

Later information, however, did not seem to justify this step, as upon careful inquiry I found that the cattle so shipped came directly from the West, where contagion did not exist, nor did they pass through the counties of this State which were said to have been infected.

The true status of cattle disease in this State is not an easy matter to develop, as the farmers, brokers, and shippers would seem to have a direct interest in the concealment of a pest amongst the cattle.

I have the honour to enclose herewith a paragraph from the "Sun" newspaper of this city, which will show the conflicting reports as to the disease.

I have also the honour to enclose the printed copy of a Bill now pending before the Legislature of this State, having for its purport the prevention of the spreading of infectious cattle diseases.

I have, &c.
(Signed) J. W. Lawford,
Acting Consul.

The Most Honourable
The Marquis of Salisbury, K.G.
&c. &c. &c.

Enclosure 4 in No. 43.

A Bill entitled An Act to prevent the Spread of Infectious or Contagious Pleuro-Pneumonia among the Cattle of this State.

Section 1. Be it enacted by the General Assembly of Maryland, that wherever it shall be brought to the notice of the Governor of this State that the disease known as contagious or infectious pleuro-pneumonia exists among the cattle in any of the counties of this State, or in the City of Baltimore, it shall be his duty to take measures to promptly suppress the disease and prevent it from spreading.

Section 2. And be it enacted, that for such purpose the Governor shall have power to issue his proclamation, stating that infectious or contagious disease exists in any county or counties of the State, or in the City of Baltimore, and warning all persons to seclude all animals in their possession that are affected with such disease, or have been exposed to the infection on contagion thereof, and ordering all persons to take such precautions against the spreading of such disease as the nature thereof may in his judgment render necessary or expedient; to order that any premises, farm or farms, or stables, where such disease exists or has existed, be put in quarantine, so that no domestic animal be removed from or brought to the premises or places so quarantined, and to prescribe such regulations as he may judge necessary or expedient to prevent infection or contagion being communicated in any way from the places so quarantined; to all upon call sheriffs and deputy sheriffs to carry out and enforce the provisions of such proclamations, orders and regulations, and it shall be the duty of all sheriffs and deputy sheriffs, to obey and observe all orders and instructions which they may receive from the Governor in the premises; to employ such and so many medical and veterinary practitioners, and such other persons, as he may from time to time deem necessary, to assist him in performing his duty as set forth in the first section of this Act, and to fix their compensation; to order all or any animals coming into the State, to be detained at any place or places for the purpose of inspection and examination, provided that animals coming from a neighbouring State, that have passed a veterinary examination in said State, and have been quarantined and discharged, shall not be subject to the provisions of this Act; to prescribe regulations for the destruction of animals affected with infectious or contagious disease, or of those in direct contact with such, and liable to spread the disease, and for the proper disposition of their hides and carcasses, and of all objects which might convey infection or contagion; provided, that no animal shall be destroyed unless first examined by a medical or veterinary practitioner in the employ of the Governor as aforesaid; to prescribe regulations for the disinfection of all premises, buildings and railway cars, and of all objects from or by which infection or contagion may take place or be conveyed; to alter and modify from time to time, as he may deem expedient, the terms of all such proclamations, orders and regulations, and to cancel or withdraw the same at any time.

Section 3. And be it enacted, that any person who shall transgress the terms or requirements of any proclamation, order or regulation, issued or prescribed by the Governor, under the authority of this Act, shall be deemed guilty of a misdemeanor.

Section 4. And be it enacted, that any person who shall sell, or otherwise dispose of, an animal which he knows or has reason to believe is affected by the disease, or has been exposed to the same, shall forfeit to the State not less than $50 nor more than $100.

Section 5. And be it enacted, that all the necessary expenses incurred under direction or by authority of the Governor, in carrying out the provisions of this Act, shall be paid by the treasurer, out of any moneys not otherwise appropriated, upon the warrant of the comptroller, on being certified as correct by the Governor.

Section 6. And be it enacted, that in the event of its being deemed necessary by the Governor, or any agent duly appointed by him under the provisions of this Act, to prevent the spread of contagion or infection, to cause any animal or animals not actually diseased to be slaughtered, the value of such animal or animals shall be fairly appraised, and a record kept and a report made thereof, to the General Assembly at its session next ensuing, with a view to the reimbursement of the owners of such animals so killed, should provision therefor be made by law, it being provided that the carcasses of animals so killed and found entirely free from disease, shall, if practicable, be sold, and the proceeds of such sales shall be paid over to the respective owners of the cattle, and the amounts so received and paid over noted against the appraised value thereof.

Section 7. And be it enacted, that this Act shall take effect from the date of its passage.

Enclosure 5 in No. 43.

BALTIMORE "SUN," Newspaper, March 27, 1880.

PLEURO-PNEUMONIA IN MARYLAND—THE QUESTION OF ITS EXISTENCE HERE DISCUSSED—VIEWS OF PRACTICAL MEN—HOW IT MAY BE STAMPED OUT.

(Reported for the Baltimore "Sun.")

IN connexion with the Bill now before the State Legislature, introduced by Senator Geo. H. Williams, of Baltimore county, and which has passed the Senate, looking to the prevention or spread of lung fever or pleuro-pneumonia among the cattle in this State, the Belair "Ægis and Intelligencer" has a long article. Mr. Williams, in presenting the Bill, said that his barnyard in Harford county had been swept by the disease, and it was also stated that Senator Stump, of the same county, had also lost three cattle from the same cause.

The "Ægis" says that

"The subject was brought forward at a meeting of the Deer Creek Farmer's Club, held last Saturday, at the residence of Mr. R. Harris Archer. The members of this club own together at least a thousand head of cattle. A thorough inquiry at the meeting established the fact that not a single case of pleuro-pneumonia or other dangerous disease exists among the cattle owned by the members of the club, and none of the gentlemen present knew or had heard of any cases of disease of any kind among stock in any part of the county.

"In view of the reports, however, the club appointed a committee, consisting of Messrs. A. M. Fulford, Thomas A. Hayes, Dr. James M. Magraw, William Munnikhuysen, John Moores, and William F. Hayes, to investigate all the facts upon which the reports were based. This Committee ascertained, in the first place, that no cattle have died on Senator Stump's farm. The committee state that all of Mr. Stump's cattle are healthy, showing no signs of disease of any kind.

"The committee next visited Senator Williams's farm. There they found some cause for apprehension, but nothing upon which to base a positive assertion that pleuro-pneumonia existed among Mr. Williams's cattle. The committee were informed that two years ago a steer was brought to the farm from Baltimore city. This animal did not thrive as the other cattle, and died last summer. During last winter two cows also died, but the manager of the farm expressed a decided belief that their death was occasioned by old age. In February of the present year another cow was taken sick and was killed. No post-mortem examination was made of the steer or the cow, and no one familiar with the symptoms of pleuro-pneumonia saw them. On Monday of the present week a veterinary surgeon from Baltimore city visited Mr. Williams's farm, and upon examining the cattle selected one, a yearling, and pronounced it unsound. He could not possibly pronounce it a case of pleuro-pneumonia without making a post-mortem examination, and the animal was accordingly slaughtered. The lungs, which are the parts immediately affected, were taken by the veterinary to the city to be subjected to microscopic examination. The remainder of Mr. Williams's cattle, twelve or fourteen in number, are to all appearances healthy and in fine condition. We have ourselves made the most diligent inquiry among farmers from all parts of the county, and have been unable to discover the existence of disease of any kind among the cattle anywhere in Harford county. Pleuro-pneumonia, if it exists here at all, is confined exclusively to the farm of Mr. Williams."

In opposition to these assertions, the veterinary surgeon who visited Senator Williams's farm states that he found three cattle with all the external evidences of pneumonia. Permission was given to slaughter one of them, and it disclosed the well-marked lesions of pleuro-pneumonia. It would undoubtedly have furnished a thoroughly good point of contagion for all fresh cattle with which it came in contact, the diseased portion of the lung breaking down without even the protection of a cyst wall, and the pus being unusually offensive. He says that the symptoms were too plain to need any microscopic examination being made; that he found three cattle with all the external evidences of pneumonia. Permission was given to slaughter one of them, and the lungs were found to be badly affected. He states, that in company with another surgeon, who has had much experience of the disease, he has found in several parts of the State fully developed cases of the disease, some of them within the city limits of Baltimore. It is true that all of these cases are isolated ones, but they will form a centre from which, under favourable circumstances, the disease may be disseminated. The greatest danger will be found a few weeks from now, when cattle which have been confined to the stable all winter are turned out to grass. When once an animal has had the disease, even if it seems to recover, the seeds remain, and may, under certain conditions, be communicable. Besides the danger of infection from the animal itself, the car in which it is housed while sick can also become a medium for conveying the disease. The State Board of Agriculture of Pennsylvania have decided that all the cases of pneumonia in that State can be directly traced to infection from Maryland cattle, and they have called a meeting for Friday next, in Harrisburg, at which New Jersey will be represented, to take some action in the matter. They threaten that unless Maryland adopts some measures of prevention against the spread of the disease they will establish a 90 days' quarantine against all Maryland cattle, an action which would naturally injure the commercial interests of the State. Those who claim to be informed, say, that if the disease should once pass west of the Alleghany mountains, no power could stop its spread, and that the only plan for Maryland to adopt is to kill all sick cattle and isolate the rest, and thus stamp out the disease in a few weeks.

Pleuro-pneumonia is not an exaggerated type of pneumonia, but a separate and distinct disease. Neither is it indigenous, like hog cholera, but has been imported. Massachusetts succeeded by vigorous measures in stamping it out in 1859, and now that England has freed herself from it, she will guard against its re-introduction from any of the Atlantic States.

No. 44.

LETTER from the ACTING BRITISH CONSUL at BALTIMORE to the MARQUIS OF SALISBURY.

Sanitary, No. 4.

My Lord Marquis, Baltimore, April 8, 1880.

With reference to my Despatch, No. 3, of the 8th instant, upon cattle disease in this State, I now have the honour to report that the Bill then pending before the State Legislature, a copy of which I have enclosed, being No. 2 for the provision of the spreading of pleuro-pneumonia amongst cattle, has now become a State Law.

This is regarded here as being an important item, and I shall endeavour later, to bring to your Lordship's notice any cases of its workings or evasions.

I have, &c.
(Signed) J. W. LAWFORD,
Acting Consul.

The Most Honourable
The Marquis of Salisbury, K.G.
&c. &c. &c.

No. 45.

LETTER from the ACTING BRITISH CONSUL at PHILADELPHIA to the MARQUIS OF SALISBURY.

No. 3, Sanitary.

My Lord, British Consulate, Philadelphia, April 16, 1880.

I have the honour to report to your Lordship, with reference to contagious diseases among cattle in this consular district, that during the months of February and March but few new cases of pleuro-pneumonia have occurred in the State of Pennsylvania, and that no cases, as far as I have been able to learn by careful inquiry, in the six Western States of this consular district have been discovered. These States, namely, Illinois, Ohio, Wisconsin, Michigan, Indiana, and Iowa, all west of the Allegheny mountains, receive no eastern cattle, and import but few of the finest English breeds direct from the eastern sea-board.

It can, therefore, be taken for granted that the disease pleuro-pneumonia has not extended from the Eastern States, where it has more or less prevailed, across the mountain belt to the extensive cattle raising districts of the western portion of the United States.

The Government of Pennsylvania are increasing, month after month, their efforts for the eradication of the disease which has been discovered, since the stringent investigations made during the past year, to be so disastrous to the dairy farmers of the Commonwealth. Particular attention is at the present time directed to the promiscuous shipment of live stock from the Baltimore (Maryland) stock yards to the open markets of Philadelphia, and it is expected that in a short time a strict quarantine will be enforced on the railways entering the borders of this State. The State of New Jersey, which adjoins Pennsylvania on the east, but is not within this consular district, will forcibly encourage the authorities of this Commonwealth in repressing the importation of unhealthy cattle from Maryland, where it is now well established, pleuro-pneumonia prevails to a considerable extent.

As applicable to this subject I have the honour to enclose your Lordships copies of a report of a paper read at a special meeting of the farmers and cattle breeders of Maryland, by Mr. John W. Gadsden M.R.V.C., a very able veterinary surgeon practising in this city, and who has taken a deep interest in, and continuously laboured for, the crushing out of the disease in this part of the country. The State of Maryland, in consequence of Mr. Gadsden's representations, is about to pass an Act for the prevention of the spread of pleuro-pneumonia among cattle within its limits, copies of which are herewith enclosed. No. 1.

A deep interest continues to prevail throughout the Western States in the passage of a general Act by the Congress of the United States applicable to the entire Union with full powers invested in a body of Commissioners for the suppression of the disease. Three Bills have been brought in, differing more or less in particulars, for the purpose. No doubt one of them will be enacted during the present session.

I beg to enclose your Lordship a copy of two articles upon this subject, just published, the authors of which are practical men, and deeply interested in the matter.

I have, &c.
(Signed) GEORGE CRUMP.

The Right Honourable,
The Marquis of Salisbury, K.G.
&c. &c. &c.

Enclosure 1 in No. 45.

PLEURO-PNEUMONIA.—PAPER read by DR. JOHN W. GADSDEN, M.R.V., COLLEGE of ENGLAND, at the MASS MEETING held at the COURT HOUSE, TOWSONTOWN.

"Pleura-pneumonia," better known to us as the "lung plague of cattle," is a malignant fever, introduced into the system of a healthy animal by contagion. This is a specific disease different from all other diseases of man or beast—not influenced by exposure to inclement weather, bad ventilation, changes of temperature, &c., which might cause ordinary inflammation of the lungs. Of all cattle diseases this, in the long run, is the most destructive, because the most insiduous and the least likely to rouse a people to united action for its suppression. It has a period of incubation which is variable. There is often an interval of from one to two months from the reception of the contagion to the first general symptoms of this disease, but the usual time it remains latent in the system appears to be from ten days to two months. In many cases the disease creeps on very slowly, the only symptom being a slight cough, but of a peculiar character, which is often not noticed by the owner. The coat looks dull and staring. When the animals are made to move briskly they commence to cough. I will not detain you with all the symptoms unless you wish them, as that would take up too much of your time.

I quite agree with Professors Gamgee, Law, McEachran, and Laintard, that this disease never originates in this country, but as the result of contagion; therefore it can be prevented. We have no proof that any other than bovine animals will receive the infection. Whenever it appears it spreads in proportion to the opportunities for transmission. The long period of incubation renders its conveyance to great distances perfectly possible. In winter, when the cattle are confined to the stables, and but little communication with other herds takes place, the malady diminishes in severity;

but in fine weather, when grazing commences and different herds meet, if there is a diseased animal among them, it soon spreads. This fact is noticed every summer in Alexandria, Virginia, where the cattle are turned out on the commons together. A suspension of cattle traffic and movement in an infected country quickly reduces the number of attacks. This was proven beyond the possibility of a doubt during the past six months in Pennsylvania, as in localities where the disease had been for years it cannot now be found, owing to the strict quarantine of stock where the disease existed. Up to the 1st of November last the special agent of the Governor had quarantined 27 herds, which included 408 animals, distributed in seven counties of the State. Now they would not be able to find the disease if fresh diseased animals had not been sent in from other States. They still keep to the three months quarantine, but have only now four centres of contagion. Calves are often affected, and become carriers of the contagion. I have seen this fact several times proved in my practice in England. About 18 years ago, in Berkshire, I remember a large dairy of fine cows swept away by this disease through buying one sick calf, and employing an ignorant ' ' cow doctor" who did not believe in contagion or infection. We traced out and found the calf came from a diseased herd in another county.

This disease was first introduced to this country in 1843, through a German cow imported direct from Europe, and taken from shipboard into a Brooklyn cattle shed. Here it was communicated to other cattle, and is said and believed to have prevailed in King's county, Long Island, more or less ever since. The authorities of New York have been vigorously engaged during the past year in stamping out the disease. In a valuable work written by Professor Law, of Cornell University, the progress of the disease is accurately traced from moving infected animals from one part of the State to another. It also contains valuable information which should be read with interest by all who raise or deal in cattle.

Professor Gamgee, in a paper written in 1871, and published in the report of the Commissioner of Agriculture, on the disease of cattle in the United States, traces the history of pleuro-pneumonia in this country from 1843 to 1868. As the professor is a man thoroughly versed in all diseases of animals, and spared no pains or expense to make his report perfect in every respect, the symptoms of the disease and post mortem appearance being particularly explicit and accurate, the paper is a very valuable one.

I have personally examined cattle with this disease, both before and after death, in the States of New York, Pennsylvania, and Virginia, and have no hesitation in declaring the disease there prevailing to be the same which occasioned such great losses in England, having made many post-mortems in that country of that specific disease.

Now I will give you as briefly as possible the opinions, published to the world, of some thoroughly scientific men who have made this disease a study for a number of years.

Professor Law, Cornell University, New York, says, "It is a specific contagious " disease peculiar to cattle, and manifested by a long period of incubation, (ten days to " three months,) by a slow insidious onset, by a low type of fever, and by the occurrence " of inflammation in the air passages, lungs, and their coverings with an extensive " exudation into the lungs and pleura."

Professor Laintard, New York Veterinary College, says, "Contagious pleuro- " pneumonia has at last forced itself upon the American public. This great danger has " been lurking in our midst, gaining strength day by day, as it quickly spreads from " numerous foci of propagation, waiting only for the opportunity to spread like wild-fire " throughout our land."

Professor Simonds, Principal of the Royal Veterinary College, London, says, that " pleuro-pneumonia in cattle is traceable to the introduction of newly-purchased animals, " who often bring the disease in a latent state with them, and which, on its declaring " itself, extends by ordinary infection to those with whom they are located. The same " fatality which marks the progress of the disease here attends it everywhere, and " throughout the continent it is looked upon as an incurable disease, and dealt with " accordingly."

Professor Walley, Principal of the Edinburg Royal Veterinary College, says, "pleuro- " pneumonia is an insidious, exudative, zymotic disease, due to a specific poison or " ferment peculiar to the ox, and having its local manifestations concentrated in the " lungs and pleura. No age, breed, or class, neither set of bovine species enjoy " immunity from the effects of the virus of this disease. It is one of the most insidious " diseases with which we are acquainted, and I do not hesitate to assert that it has been " the cause of greater losses to British stock owners and dairymen than any other single " disease to which animals are subject. No estimate, not even an approximate one,

" could possibly be made of the losses sustained by it, for the simple reason that
" thousand of cases never come under the cognizance of the authorities. It is alike
" contagious (by actual cohabitation) and infectious. The period of incubation is more
" indefinite than in any other zymotic disease, with the exception of glanders and rabies,
" while the average period may be stated at from three weeks to three months. It very
" frequently happens that it is prolonged to four or six months."

Professor Williams, Principal of the New Veterinary College, Edinburgh, says,
" Pleuro-pneumonia is a contagious, febrile disease, peculiar to horned cattle, having an
" incubative period of from two to three weeks, to as many months, at the end of which
" local complications arise in the form of extensive inflammatory exudations within the
" substance of the lungs and upon the surfaces of the pleura, finally resulting in con-
" solidation of some portions of the lungs and adhesion of the pleural surfaces. In some
" cases there is extensive and rapid destruction of lung tissue, with death from
" suffocation, but most commonly the disease is of a lingering character, with symptoms
" of great prostration."

Mr. George Fleming, F.R.G.S., &c., says in his most valuable works on veterinary science :

" Pleuro-pneumonia of cattle is a specific and contagious disease peculiar to bovine animals, and of a sub-acute or chronic character. It usually appears as an epizootic or enzootic malady, and in consequence of its insidious invasion, the subtlety of its contagion, its general diffusion, and the great fatality attending it, it is a most serious scourge in every country in which it has appeared. It has caused an immense destruction, perhaps greater on the whole than cattle plague (Rinderpest) as in very few countries have any active steps been taken to eradicate it."

In the annual report of the Commissioner of Agriculture to the President, dated Washington, D.C., November 15th, 1878, is the following :

One of the most dreaded contagious disease known among cattle is that of pleuro-pneumonia or lung fever. It was brought to this country as early as the year 1843, and has since prevailed to a greater or less extent in several of the Eastern and a few of the Southern States. It made its appearance about a century ago in Central Europe, and has since spread to most European countries. With the exception of rinderpest it is the most dreadful and destructive disease known among cattle. Unlike Texas cattle fever, which is controlled in our northern latitude by the appearance of frost, this disease " knows no limitation by winter or summer, cold or heat, rain or drought, high or low " latitude." It is the most insidious of all plagues, for the poison may be retained in the system for a period of one or two months, and even for a longer period, in a latent form, and the infected animal in the meantime may be transported from one end of the continent to the other in apparent good health, yet all the while carrying and scattering the seeds of this dreaded pestilence.

Since the appearance of this effection on our shores it has prevailed at different times in the States of Massachussetts, Connecticut, New York, New Jersey, Maryland, Delaware, Virginia, and in the district of Columbia. It has recently shown itself at two points in Virginia (Alexandria and Lynchburg) where it was recently prevailing in a virulent form.

At present the disease seems to be circumscribed by narrow limits, and could be extirpated with but little cost in comparison with the sum that would be required should the plague be communicated to the countless herds west of the Alleghany mountains. This disease is of a such a destructive nature as to have called forth for its immediate extirpation the assistance of every European government in which it has appeared, many of them having found it necessary to expend millions of dollars in its suppression. The interests involved in this case are of so vast a character, and of such overshadowing importance, both to the farming and commercial interests of the country, as to require the active intervention of the Federal Government for their protection, and for this reason the considerate attention of Congress is respectfully asked to this important matter.

It is of vital importance, not only to stock raisers and dealers, but also to capitalists and those interested in shipping and steamship companies, that this disease should be stamped out of this country as soon as possible. England having lost cattle by this disease valued at about $10,000,000 per year, is making vigorous efforts to eradicate it ; therefore dreads its re-introduction and placed an embargo on the importation of American cattle where she will not remove until this country is free from the disease.

It is time that our people had awakened to the importance of this subject, for Canada is now endeavouring to secure the cattle trade of this country.

The following telegram will show the effort she is now making :

"By Atlantic Telegraph, London, December 3, 1879.

"The 'Times,' discussing the appointment of Sir A. T. Galt, as Canadian Minister, resident in London, says, 'The Home Government consider it highly desirable that the 'Dominion should be represented in England by a Cabinet Minister, who can give 'expression to the views and policy of the Canadian Government of the day. It con-'cerns the interest of Canada that the embargo placed upon United States cattle 'imported into this country should be removed, for at present a large source of profit 'to the Dominion railways, shippers, and middle men is lost owing to its existence. It 'is not unreasonable to expect that cattle from certain divisions of the United States 'which are far removed from the districts where pleuro-pneumonia exists, might be 'permitted to pass through Canada on conditions of effective inspection at ports of 'entry and landed in this country on the same terms as Canadian cattle. The sole 'reason for maintaining the embargo is to prevent the importation of the contagious 'disease, and it may be possible for the Canadian Minister resident here to submit a 'scheme of safeguards which will obviate the necessity for this country applying 'prohibition to the whole of the United States.'"

Now, if they can succeed in releasing that portion of the United States west of the Alleghany mountains, and in which at present there is no disease, the western cattle can be transported on Canadian railways to Canadian ports and shipped on Canadian steamers to England, and Canada will reap the benefit and obtain the trade which should seek Boston, New York, Philadelphia, and Baltimore as its natural outlets.

In Philadelphia alone the American Steamship Company had made arrangements last spring to ship 700 head of live cattle per week, which was to have been increased to 1,000 weekly during the summer months, but the entire trade is now stopped by reason of the embargo.

We can rest assured of one fact, that England wants cheap beef, and offers an excellent market for our cattle, but she will not have them so long as this disease continues, and shipping them is attended with the risk of introducing pleuro-pneumonia.

Enclosure 2 in No. 45.

CONTAGIOUS CATTLE DISEASES.—WHAT HAS BEEN DONE BY THE STATES.

The present status of legislation on cattle disease is far from satisfactory, and is calculated to create the greatest apprehensions on the part of all having special acquaintance with the matter. A year ago, when England shut her ports against American cattle, New York, as the largest exporting State, took prompt action, and was followed by New Jersey and Pennsylvania. But in not one of these States has the work been carried out in the spirit in which it was begun.

In New York, as successive developments showed that the lung plague was far more widely prevalent than had been at first supposed, it soon became clear that the appropriation made by the Legislature was most inadequate to pay for the work demanded. Concerning "infectious disease affecting domestic animals," it was, by the law of 1878, "the duty of the Governor to make measures to suppress the same promptly, and to prevent the same from spreading." But the Governor, who had established a special reputation for economy, refused absolutely to exceed the appropriation by a single dollar, preferring to let the Veterinary Sanitary Staff disband, and to allow the plague to spread once more over the ground that had been conquered, the money that had been expended to be worse than thrown away, and the moral effect of the success to be lost rather than incur any appearance of personal responsibility, or add to the indebtedness of the State.

To obviate the probably irremediable results of an entire suspension of work, the acting officials had to reduce the force, give up most of the effective suppressive work, and confine their efforts mainly to preventing any renewed spread of the disease; and this they have maintained for seven months, until the Legislature should come together and find time to make a new appropriation. This has now been obtained and active suppressive measure recommenced, which it is to be sincerely hoped will not again be interferred with, from any cause whatever, until the last trace of infection has been driven from the State, and until the danger of infection from other adjacent States has been entirely removed.

In *New Jersey*, where the law provided for the payment of all necessary expenses out of the State Treasury without any special appropriation, and where, accordingly, there should have been no hindrance to the most prompt, extensive, and effective work, the opposion of political enemies, unfortunately, drove the official into a temporising policy, which has only brought them a double defeat. To avoid the imputation of extravagant expenditure, the officials virtually abandoned the principle of compulsory slaughter, and killed only such animals as the owners were willing to sell to the State at a very low price. When the owner was indisposed to part with his stock on these terms, they were quarantined on the premises, all ingress and egress of cattle being forbidden; and as the disease usually leaves encysted masses of dead lung in the chest for months, and even for a year and more, the duration of such quarantine necessarily became practically endless, and the only resort for the owner was to fatten as many as possible, and sell them to the butchers and to give up the rest to the State. Meanwhile his milk, cheese, or breeding business was stopped, so that his losses were by no means confined to the sacrifice of his stock. The system naturally developed much dissatisfaction among the owners of stock, and entailed a very considerable outlay for the prolonged quarantine under *expert* supervision, and of these the enemies of the measure made good use in the present Legislature, and secured not only the discharge of the officials, but the repeal of the law. A movement is on foot to have the same law re-enacted, or another passed; but with the inimical elements in the way, it remains to be seen whether anything can be accomplished.

In *Pennsylvania* a number of diseased cattle have been killed, and Mr. Edge appears sanguine that the plague has been in the main suppressed; but, to one who has had an extended experience with the malady, it does not appear that his confidence has a sufficiently stable basis. From the printed report it appears that in certain herds the acutely sick have been killed, and after a short interval the herd has been released from quarantine as sound animals. In such circumstances it cannot be doubted that many cattle bearing encysted masses of infecting matter in the chest must have been turned loose upon commerce. Moreover, in the Philadelphia as in the Jersey City stock-yards, no sufficient pracautions are taken to prevent the contact of healthy and sick, of store and fat cattle; and these yards are thus made pestilential centres from which infection is widely distributed. To show that this is not overstated, it need only be named that the inspectors on the New Jersey frontier of Pennsylvania, in a short time, turned back into the latter State over fifty head of cattle affected with the lung-plague. Dr. Gadsden, of Philadelphia, writes us: "We have several fresh outbreaks clearly traced to diseased "cattle from the Baltimore cattle market. *The authorities here have not taken any* "*steps to prevent the sale of such animals in the cattle markets of this city.* * * "Am afraid Baltimore will do nothing in the matter. They send, on an average, 400 "head of cattle from that market to Philadelphia every week, and I am informed on "good authority that there are from 100 to 150 diseased animals with pleuro-pneumonia "in the vicinity of Baltimore; also, that there is no law in the State to prevent the "spread of the disease, and that every week 2,000 cattle change hands. So you see "how we stand."

The Baltimore cattle market is very largely supplied from Virginia, where, on the occasion of our visit, a year ago, we ascertained that the lung-plague was extensively prevalent.

Connecticut has had cattle diseased with the lung-plague in the town of Greenwich for a year past, and, after continuous efforts that would have discouraged any man who was less enthusiastic and determined, Hon. H. E. Hyde has succeeded in advancing, in both houses, a most effective bill, which, it is hoped, will soon become a law.

A showing such as the above is by no means encouraging as to a speedy extinction of the lung-plague, and is largely calculated to create many and painful doubts as to the probability of our reaching any such extinction at all. Out of seven infected States, three only have attempted anything, and not one of the three has accomplished anything like what it might and ought to have done. Meanwhile, the whole political horizon is beclouded with the smoke of the battle waged for success in the Presidential campaign, and the indications are only too strong that the question of averting the calamity of this plague from the country will be quite lost sight of in the question, so much more congenial to the partizan mind, of who shall next occupy the White House.

Probable Cost of Stamping out Lung-Plague.

Well sustained and properly directed efforts for the extinction of the lung-plague should rid the United States of the incubus in the course of two years, and the expense would probably not exceed $2,000,000. This estimate is based on the supposition that the plague does not extend beyond the limits of the seven seaboard States known to be infected, and that the money appropriated would be honestly applied to the work, under efficient officers, and not applied to create sinecures for political hacks. The country cannot afford the misapplication of such a fund. The success of this effort in animal sanitation involves much more than the suppression of the lung-plague of cattle, though even this would far exceed in its benefits the extinction of the entire debt created by the civil war. The successful extinction of the lung-plague will give a reasonable hope of the future extinction of the swine-plague, and of most of the other animal contagions that now devastate our flocks and herds. It means the ultimate saving of scores or hundreds of millions yearly to the stock raisers of America. It means the suppression of contagions and parasites that now destroy our farm animals, and are by them conveyed to the human being. It means the preservation of human health and the lengthening of human life, the enchancement of the value of labour, and of the wealth and power of the Nation.

Present Losses from Lung-Plague.

To many, and no doubt to legislators, the estimate of $2,000,000 as the cost of eradicating this plague, will be startling. But a correct statement of our present losses, if such could be obtained, would be more astonishing still. To take but one item of such losses as were caused by the closure of England against our cattle. One of the most extensive exporters of cattle estimates the difference between the returns from cattle that must be slaughtered at the docks at Liverpool, and those than can be taken inland to be killed when and where they may be wanted, to not less than half a cent per pound, live weight, or $1 per hundred pounds net. On an average this would make a difference of not less than $7 per head. Other exporters have set the average as nigh as $10 per head. The exports from the port of New York alone, during 1879, were 95,370 head of cattle. The loss on these, at $7 per head, caused by the English embargo, is $667,590; at $10 per head it would amount to $953,700 or close upon $1,000,000 for the year. Add to these the exports from Boston, Philadelphia, and Portland, and the depreciation of our exports of cattle from this cause alone cannot be less than $1,500,000 per annum.

Then, if we consider the losses from this disease in our herds, we set it low at $500,000 more. Thus year by year we are taxed to the extent of $2,000,000 by this plague alone; and yet it seems probable that the outlay of a similar sum, once for all, in the work of extinction, would permanently rid us of the pestilence. We need not adduce the scores of millions which a general extension of the plague would cost us, the bulk of humanity do not care to provide against prospective evils, and judge that they have enough to do in taking care of the present; but when we can demonstrate that even at present we are squandering every year, through our shiftlessness, $2,000,000, which, if once rightly expended, would permanently remove the pestilence, surely no policy of "let well enough alone" can find a moment's acceptance with citizen or statesman.

No. 46.

LETTER from SIR E. THORNTON to EARL GRANVILLE.

(No. 12, Sanitary.)

Sir, Washington, April 26, 1880.

With reference to my Despatch No. 9 of this series and of the 3rd instant, I have the honour to state that a report on contagious pleuro-pneumonia among cattle has recently been transmitted by Mr. Le Duc, United States Commissioner of Agriculture to the Committee on Agriculture of the House of Representatives. The report is the result of investigations made by Dr. Lyman in different parts of the United States.

As it has not yet been printed, and it may be some weeks, or even months before it will appear, I have the honour to enclose a synopsis of its contents as published recently in the "New York Herald."

From this report, it appears that the disease has shown itself, and now exists in some parts of the State of Connecticut, Westchester County, New York City, and Long Island in the State of New York, and in several counties in the States of New Jersey, Pennsylvania, and Maryland.

It is supposed that the disease also exists in the District of Columbia, and in Virginia, but no investigation has yet been made in these parts.

It would seem from this report that many cattle have died of the disease in the above-mentioned States, that others have been slaughtered, that regulations made to prevent the spread of the disease are not attended to, and are sometimes wilfully evaded, and that there are quite enough infected cattle to cause the disease to spread over a large extent of territory unless stringent measures are adopted and vigorously enforced for its suppression.

I have, &c.
(Signed) EDWARD THORNTON.

Her Majesty's Principal Secretary of State
for Foreign Affairs.

Enclosure in No. 46.

PLEURO-PNEUMONIA.—CHARACTER and EXTENT of the DISEASE.—AN OFFICIAL REPORT to CONGRESS.—INTERESTING FACTS and FIGURES for HOUSEKEEPERS.—RAVAGES of the PLAGUE.—INFECTED HERDS in NEW YORK, NEW JERSEY, and other STATES.

Washington, D. C., April 17, 1880.

Mr. William G. Le Duc, Commissioner of Agriculture, has transmitted to the chairman of the Senate Committee on Agriculture an interesting report on the subject of contagious pleuro-pneumonia or lung-disease of cattle. It was prepared by Dr. Charles P. Lyman, under the instructions of the department. Dr. Lyman began his investigations in the city of New York early in February last. He says that on his arrival in that city he visited Dr. Liantard, from whom he learned that the disease still prevailed to some extent in Eastern New York and on Long Island, and that there was a reported outbreak at Haverhill, N. H. The New Hampshire State Commission had pronounced this outbreak as of a sporadic character, yet the circumstances attending it were of a suspicious nature, at least sufficiently so as to throw doubt on the decision arrived at by the State Commission, and a further investigation was regarded necessary in order to positively determine the matter.

The Disease in Connecticut.

Dr. Lyman says :—

In the course of my investigations in Connecticut the following facts were gleaned :— An outbreak of contagious pleuro-pneumonia, says Mr. E. H. Hyde, chairman of the commission, had occurred at Greenwich, occasioned by exposure to a calf which had been brought from New York and placed in the herd of Mr. B. Livingstone Mead. This farm is located on the State line, a part being in the State of New York and a part in Connecticut. This herd consisted of 20 head. The buildings are in Connecticut. From seven to nine animals have died, the last one about the 18th of March 1879. The remainder are unaccounted for. These animals were at one time examined by Professor Law.

The herd of Daniel M. Griffin, on an adjoining farm, contracted the disease from Mr. Mead's herd. He had 27 head, eight of which died. With the exception of one animal Mr. Griffin sold the remainder of the herd to dealers in New York for slaughter. The one he retained remains with his tenant, and will soon be slaughtered on the place.

Joseph B. Husted, of Greenwich, took some cattle to New York for slaughter, among them two cows. They were all landed at the infected Sixtieth street yard. The cows were not sold, and, after some hesitation on the part of the New York Commission, they were allowed to be returned to Connecticut, the Commissioners of the last-named State being notified of the fact. The State authorities at once ordered them quarantined, but before the letter reached Mr. Husted he had sold them, and they are still untraced. They were taken away from Greenwich on or before July 11, 1879.

Mr. Curtis Judson, of Watertown, near Waterbury, keeper of the Gramercy Park Hotel, bought two cows from Mr. Hedge, a dealer in New York, and placed them in an excellent herd of his own at Watertown, They proved to be effected with contagious pleuro-pneumonia, and soon affected the herd with which they had been placed. The herd was quarantined, by order of the State Commissioners, but the owner, on the 8th of March 1879 broke quarantine and took them to New York. This fact coming to the knowledge of the authorities in time, they were enabled to be in New York on the arrival of the animals, where they were at once killed by order of the New York Commission. Mr. David D. Hawley, of Danbury, had an outbreak of disease in his herd on October 27, 1879. They were visited by Dr. Hopkins, of New York, who made an autopsy of a calf and pronounced the disease tuberculosis. The calf came from New York, and had been with the herd but a month.

Mr. Porter, of Waterbury had an outbreak among his cattle on the 13th of November, which the attendant veterinarian feared might prove to be contagious pleuro-pneumonia. The herd was visited by the State Board on November 18, and the decision arrived at was that the animals were suffering simply from sporadic disease. No post-mortem examination was made, and they are now reported as doing well.

Some trouble was reported among cattle at Hartland and Milford, but on examination by the Commissioners the disease was decided to be sporadic. I visited the herd of B. L. Mead, of North Greenwich, which I found suffering from contagious pleuro-pneumonia. Although the trouble was of long standing some of the cows certainly were in a condition to convey the disease to healthy or non-infected animals. There were 10 cows, one pair of oxen, one yearling, and six calves in this herd.

The herds of Daniel M. Griffin, Joseph B. Huxted, David D. Hawley, and Mr. Porter were visited, but no cases of the plague were found. Reports from Watertown, Waterbury, North Bradford, Hartland, and Milford were of such an assuring character that I did not deem it necessary to visit those points.

New York.

I am indebted to the New York Commission for the following statement, made February 12, 1880:—

Putnam County.—On the line of the Harlem Railroad there have been lately slaughtered 176 animals; of these, forty were acute cases. The others, having been exposed to the contagion, were killed to prevent the spread of the disease. The beef was marketed.

In the town of Kent, Joseph R. Sprague has an infected herd of 60 head of cows, steers, and calves. They are now in quarantine.

Westchester County.—In Yonkers, Mr. Austin had a herd of twenty-seven head, which had been reduced by the ravages of the disease to eight animals. Mr. Pierpoint had a herd of eleven head which had been exposed to infection; two of these had been killed. Mr. Cheever, on Odell's farm, has a herd of twelve head that had been infected. Mr. Cayl has one animal infected.

In Croton Falls, Bedford township, Mr. Butler who generally keeps about fifty animals, has lost by death and slaughter, his entire herd, with one exception.

New York City.—In the city there are believed to be but five infected stables left. These are in quarantine and are located as follows:—

No. 1.—West Seventieth Street, old chronic cases.
No. 2.—West Seventy-eighth Street, acute cases.
No. 3.—East Ninetieth Street and Madison Avenue, acute cases.
No. 4.—One hundred and twentieth Street and Fourth Avenue, acute cases.
No. 5.—One hundred and twenty-first Street and Fourth Avenue, acute cases.

Long Island.

The whole western end of this island, as far back as Jamaica, is more or less infected. The stables of Gaff, Fleischmann, & Co., of Blissville, originally the hotbed of the disease, are now perfectly free from all contagion. Jamaica is located some ten and a half miles back, therefore the infected district includes Brooklyn, New Utrecht, Flatbush, Gravesend, Flatlands, and New Lots, in King's County, and Long Island City, Newtown, Jamaica, Flushing, and Creedmoor, in Queen's County.

Suffolk County.—At the extreme eastern end of the island are extensive unfenced ranges used as common pastures. The plague prevailed among herds grazing on these ranges, but it is now believed they are thoroughly freed from it, as the last known cases were destroyed at Montauk, August 28, 1879, and at Bellport, August 11, 1879. This portion of the island has been subjected to numerous examinations, and is now regarded as entirely free from the plague.

Staten Island.

A year ago one case of the plague was discovered on this island. The animal was killed. No case has since appeared, and the island is now regarded as absolutely free from the disease.

On the 12th and 13th days of February, in company with one of the New York inspectors, I visited several stables in Brooklyn. I found several chronic cases in the stables, but no acute ones. At Johnson avenue slaughter-house I was shown a portion of a characteristically diseased lung which had been taken from an animal killed a few hours previously.

On February 14 I visited the stables of Mr. Lang, 109th Street and Fourth Avenue, New York, where I found three cows suffering with the plague. One of these was a very acute case, and I was informed, had been afflicted but three days. This, and one of the others, had been condemned to the offal dock. Mr. Foudre, a neighbour of Mr. Lang's lost a cow on the 12th day of February by the disease. A week before he had bought a cow from a dealer named Louis, and the cow that died was taken sick on the day that this cow came to his stable. The nearest stable to Mr. Foudre's place is on 112th Street and Fourth Avenue. Mr. Foudre had owned the cow he had for eight months. Lang purchased his sickest cow from a dealer named named Franke some five or six weeks previous. She was a "two titter," and on that account Franke knocked off $5 on her price. She never did well. The other two commenced coughing three or four days before my visit.

On the afternoon of the same day I visited the offal dock and witnessed the autopsy of Lang's cows, alluded to above. Both cases revealed well-marked lesions of acute pleuro-pneumonia contagiosa. One of the animals, which showed a temperature of 105 degrees Fahrenheit, and thirty-six respirations per minute, had the whole posterior lobe of the left lung consolidated and strongly adherent to the costal pleura. The right lung was healthy. The pericardium was thickened to half an inch. In both lungs of the second cow were found a number of small isolated spots of the characteristic lesions of the disease, the largest being about the size of a double fist. Their borders were well defined, and the intermediate portions of the lung tissue appeared perfectly healthy to the naked eye. On February 16th, at 120th Street and Fourth avenue, I found three cows which had been exposed to infection and were in quarantine. They appeared healthy, and one had just been sold to a butcher named McEvoy.

In Fremont, at the stable of Mr. Bohle, I found two cows, one of which had been put into an infected stable on Christmas. Her temperature was 101 degrees Fahrenheit, and she was breathing at the rate of thirty respirations per minute. The other animal was a Jersey cow. Both animals had been ordered slaughtered as soon as they could be got ready for the butcher. A Mr. Cannons, a neighbour, had had some trouble with his herd, but they were quarantined and seemed to be doing well. The infection to this herd of Mr. Bohle's was communicated by a cow that was pastured with ten others on a common lot. She developed contagious pleuro-pneumonia and was killed in the month of August. Three months and nineteen days thereafter the second animal was attacked and sent to the offal dock, where she was slaughtered. At the end of three weeks a third, and at the end of four weeks a fourth animal was taken sick and both were slaughtered. The first one of these animals belonged to Mr. B. Jorkman, other three to Mr. Bohle, who, as has been before stated, bought a fresh cow on Christmas and put her in with one remaining from his original herd. This was in direct violation of the law and his instructions. She is now diseased and has been ordered to be killed. These ten animals were strictly isolated as soon as the first cow was killed, and no other infection was then possible. Two of them have since been fattened and sent to the butcher in a healthy condition. The remainder, with the exception of those belonging to Mr. Bohle, are still free from disease.

On the 17th day of February, in company with Professor Law and Dr. Hopkins, I visited the farm of Mr. Joseph Sprague, in Kent, Putnam County, whose herd was infected and had been in quarantine for some time. The herd consisted of fifty-three head, and were sold during the day by the State Commission to butchers who had been notified to attend. The animals brought an average of $6 per head, which was regarded as a low price. Three of the animals were considered too badly diseased for beef, and on being killed showed well-marked lesions of the disease in its different stages. This herd was infected by a cow purchased from a dealer named Robinson.

On February 18, in company with the same gentlemen, I visited Croton Falls, Westchester County. We found here a gentleman by the name of Butler, who had lost thirty-one animals out of a herd of thirty-two by the plague. His remaining cow was in quarantine, with no symptoms of the disease manifest. On the 15th of June last Mr. Butler bought seventeen cows of Mr. Robinson the dealer above referred to, and they were delivered to him on the 17th of the same month. They had been pastured all the the summer on "Hyatt's Lower Farm," with a cow that had been sick but had recovered. The first animal on Butler's farm sickened on September 16 and soon died. The remaining thirty head were either slaughtered for beef or killed diseased.

On February 19, in company with the same gentlemen, I visited the farm of Mr. Daniel Austin, in Yonkers, Westchester County. Originally this gentleman had a herd of twenty-seven head, eighteen of which had either died of the plague or had been killed for beef in the incipient stages of the disease. Five of the animals were killed for beef and showed no lesions of the disease. Of the four remaining, two are well-marked chronic cases—*i.e.*, having portions of encysted lungs. This herd was infected by a cow that had pastured on an infected range called "Hog Hill," in the town of Yonkers. She wandered into a field near Mr. Austin's place, where she died on the 27th or 28th of July, and was not buried for some days after. The disease appeared among Mr. Austin's cattle on October 21. The herd of Mr. Odell, on whose farm this cow died, was no doubt infected by the same animal. His herd consisted of some valuable Jerseys, among which the plague appeared on August 28. We killed three of his animals, and they all showed well-marked lesions of the disease.

On February 20 we visited Mr. Tice, of Newtown, which is a suburb of Brooklyn, L.I. This herd was infected about the middle of October. Eight of his animals died, and he had continued to fill their places with fresh animals. We found twelve of his animals suffering with the plague. Two cows were killed—one an acute and the other an older case—and both showed well-marked traces of the disease. His herd was infected by a cow sent him about the 20th of September.

A Mr. Grady, whose stables are in Blissville, a portion of the suburbs of Brooklyn, had lost eleven head of cows out of a herd of fourteen since the middle of September.

Pennsylvania.

I arrived in Philadelphia on February 24, and during the evening visited and had a conversation with Dr. J. W. Gadsden relative to the prevalence of the plague in Pennsylvania. Dr. Gadsden showed me a private telegram giving him the information that the British Government contemplates raising the embargo on cattle transported from the western and south-western States, through Canada and shipped to Great Britain from ports of the Dominion Government. On the morning of February 25, in company with Dr. Francis Bridge, I visited the farm of Mr. J. F. Taylor, located near the town of Marple, Delaware county, Pa. We found this gentleman's herd suffering with the disease. Having selected and paid for four acute cases the animals were slaughtered and examined. The post-mortem examination revealed all the lesions of the disease in its acute stage. This herd was infected by a cow purchased by Mr. Taylor in the Philadelphia stock yard. She was in very good condition, and when she arrived on the farm seemed very tired. Next morning she refused to eat and seemed sick. She died a few days thereafter with all the symptoms exhibited by those that have since died of contagious pleuro-pneumonia.

On February 26 I visited the farm of Mr. Wynne, near Philadelphia. His herd originally consisted of 34 head. Ten of these had already been killed, and two had died of the disease. An examination of those left developed the fact that the disease was still present in both an acute and chronic form. The owner objected to the slaughter of any of the animals. His herd was infected by some cows he purchased in the Philadelphia stock yards. The disease broke out about the 1st of June last.

On the 27th day of February I visited Messrs. Martin, Fuller & Co., who have charge of the Philadelphia stock yards. They offered me every facility for an examination of the premises. During my interview with these gentlemen Mr. Fuller said something ought to be done to relieve the dealers in stock from the oppression of the English embargo; that the European trade is now carried on at a positive loss, and that this loss is clearly traceable to the embago on our live cattle. He further stated that he was in Europe last season and found the market flooded at Liverpool. His stock was detained 15 days in quarantine before it could be slaughtered. Besides the expense of feeding all this time his animals were positively shrinking in weight; that when they were finally slaughtered he was compelled to accept any price offered. He found dealers there who said they could afford to give him from $15 to $20 per head more for the animals if they were allowed to drive them back into the country and slaughter them only as needed. During the day I met by appointment Secretary Edge, special agent of the Governor. He seemed to appreciate the fact that more thorough and active measures than those heretofore used are necessary for a complete suppression of the plague. He thinks the better plan would be to pay a good price for all exposed animals, and that in the country all exposed and infected animals should be slaughtered, as well as those acutely diseased. Under existing circumstances he does not think it would be politic for the State of Pennsylvania to thoroughly eradicate the disease; indeed, he does not think this possible so long as the southern border of the State is unprotected from importations from Maryland. Until quarantine measures are established against this State, or the State itself takes some action for the suppression of the disease within its borders, the State of

Pennsylvania cannot hope for success. The farmers of Pennsylvania will go the Baltimore stock yards to buy "frames," and in this way new cases are continually being brought into the State. Under the present construction of the law sufficient means to pay a fair indemnity cannot be obtained, and to kill even diseased animals without funds to pay for them the secretary believes would result disastrously, as it would prejudice the farmers against a better law which is hoped for in the near future. His policy is simply an effort to keep the disease within its present limits, with the destruction of as few animals as possible. Up to January 1, 1880, the secretary had expended but $2,700 in repressive measures.

On February 28, while examining some cows at the stock yards, I found an acute case of contagious pleuro-pneumonia. The affected animal was in a yard with some 20 other milch cows, and all were being offered for sale. This animal was seen also by Dr. Bridge. On March 1, while examining lungs of slaughtered animals at the Philadelphia abattoir, I found one showing the well-marked lesions of the plague. The butcher said the animal came from Illinois, but it was afterwards traced to Cecil County, Md. On the 2nd day of March I visited Camden, and learned some facts relative to the extent of the plague in New Jersey. On the 3rd inst. I attended a meeting of the farmers and stock raisers in the infected district. The meeting was held in Philadelphia and was called for the purpose of devising means for the extirpation of the plague. During the day I visited Elm station, Montgomery County, and assisted in selecting six diseased animals from Mr. Wynne's herd for the purpose of post-mortem examination. On the 4th and 5th days of March I was engaged in examining lungs of slaughtered animals at the Philadelphia abattoir. I found no traces of the disease, but, on the 4th inst., while examining some cows at the stock yards, I found a second case of the plague in an animal that came from near Gettysburg, Adams County, Pa.

The following are the sources of infection and locations of diseased herds in Pennsylvania:—

Philadelphia County.—The Philadelphia stock yards are infected. These yards are constantly receiving and sending out to different localities diseased and infected animals.

Chester County.—Mr. M. Covning, of Chester Valley, has a herd of 27 head, among which the disease has appeared. The herd was infected by a cow purchased from a drover, and the infection could not be traced.

Mr. J. Dickinson, of Chester Springs, has a herd of 28 head. These animals were infected by the owner, who brought the contagion from a neighbouring farm where he had administered medicine to a diseased animal.

Mr. G. V. Rennard, Chester Valley, had a herd of 18 animals infected by his neighbour's cattle (Mr. Covning's).

Mr. Rennard's cattle had infected a herd of 14 head, owned by Mr. J. W. Wilson, his near neighbour.

Mr. C. Holland Frazer, of the same neighborhood, had a herd of 26 head infected by a purchased animal, which he was unable to trace.

Mr. W. Pugh, of Chester Springs, had his herd infected by Mr. Dickinson, alluded to above, who visited this herd for the purpose of administering medicine to a sick animal.

W. J. and H. A. Pallock, Downington, had a herd of 30 head infected by a purchased animal.

Mr. W. Reid, Westchester, herd of five head. Chronic cases; source of infection unknown.

Mrs. Hermann, Westchester, herd of 12 head. Infected from neighbouring cattle.

Mr. W. E. Pennypacker, Cambria, herd of 14 head. Probably infected from neighbouring herd.

Holmes and Bunting, Oxford, herd of 35 head. Infected by Mr. Turner's cattle on adjoining farm.

Mr. M. Young, Bradford, herd of 36 head. Infected by Mr. Turner's cattle.

Between the herds of Holmes and Bunting and Mr. Turner was a large meadow. The bulls broke down the two intervening fences and the herds mingled in the meadow. The herds were separated as soon as men on horseback could separate them, but not soon enough to prevent infection.

Montgomery County.—Messrs. J. L. and A. S. Reiff, Worcester, herd of 15 head. Jacob L. Reiff had bought of five different dealers during May and June, and it was impossible to tell from which one the disease came. Two animals have died and two others have been killed by order of the State inspector. Five others had been slightly affected, but had recovered. A. S. Reiff purchased a cow of his son in July, about the time of the outbreak. One animal died, and a second one was condemned and killed by order of the State inspector. Five other animals were affected, but all had recovered, and had been released from quarantine.

Joseph Tyson, Worcester, herd of 13 head. Mr. Tyson purchased a cow of a man who had previously purchased her at the Philadelphia stock yards. She was killed on September 24, 1879, by order of the State inspector, but as she had been isolated on the appearance of the first symptoms of the disease only one other animal was infected.

Charles T. Johnson, Lederachsville. This gentleman's herd was infected by an animal purchased from a dealer. Up to the date of the first inspection in October last five animals had died. One was afterwards condemned and killed. Five out of the remaining 10 were affected, but had recovered.

Peter M. Frederick, Lansdale. Herd quarantined January 29, 1880. The infection was communicated by a cow purchased in the Philadelphia stock yards. Two animals had been condemned and killed. The remainder, 10 animals, were free from disease on March 4.

Jacob D. Wisler, Worcester. Herd quarantined February 6. Three animals had been condemned and killed, and three others were sick.

John C. Blattner, Worcester, herd of 16 head. The plague had prevailed in this herd in a mild form for the past four months. None of his animals died, and he did not suspect the nature of the disease. His cows were greatly reduced, and he had been feeding at a loss. One of his animals had commenced to lay on fat, and all were free from disease except the altered structure of the lungs, the natural result of the disease. This herd was infected by Mr. A. S. Reiff's cattle, mentioned above.

W. W. Latrobe, Merion, herd of 14 head.

W. Wynne, Elm Station, herd of 28 head. This gentleman had lost several animals. The infection came from a cow purchased at the West Philadelphia stock yards.

Bucks County.—Aaron Yoder, Dublin. This herd was quarantined September 25. The first to sicken was one that he purchased two weeks previously. As she had passed through the hands of three different parties, it was impossible to trace her back satisfactorily. Three out of the four were affected, but had recovered.

Isaiah Kletzing, Dublin. This herd received its infection from Yoder's cattle before they were quarantined. Three animals had recovered.

Lehigh County.—Charles Krauss, East Greenville. This herd was quarantined December 13. The infection came through a cow purchased at the Baltimore stock yards. Two animals died, and 11 were condemned to be killed. Thirty animals remain and are thought to be free from disease.

Cumberland County.—Samuel Hess, Ebersley's Mills. Herd quarantined March 20, 1879. Infected by cattle coming from Baltimore stock yards. This herd is in York County.

Delaware County.—R. L. Jones, Upper Darby, herd of 49 head. Infected by purchase from Philadelphia stock yards.

Thomas Cunningham, Upper Darby, herd of 21 head.

J. G. Haenn, Darby, herd of 14 head.

J. Lickens, Ridleyville, herd of 15 head.

J. F. Taylor, Marple, herd of 36 head. One-third of his animals had died, and the disease was still present.

Lancaster County.—J. F. Turner, near Oxford, Chester County, herd of 52 head. Infected by the adjoining herd, into which the disease had been introduced by some calves brought from the State of New York.

David Williams, Colerain. This herd had come in contact with the diseased Oxford herd, and was quarantined before any symptoms of the disease appeared.

Lane Gill, Colerain, herd of five head, adjoining above.

Adams County.—J. Redding, Gettysburg, herd of 13 head. Infected by purchase from Baltimore stock yards.

New Jersey.

The following are the locations of some of the diseased herds in New Jersey at the time of my investigations in February:

Atlantic County.—Benjamin Gibberson, Port Republic, herd of 11 head. This herd was quarantined October 29, and again on November 28, as chronic cases. Eight animals had been affected by the disease.

H. A. Johnson and William Ramsay, both of Port Republic. The herds belonging to these gentlemen were diseased and in quarantine.

Gloucester County.—Charles B. Leonard, of Paulsboro, has two farms, upon one of which, he has a herd of 22 animals, six of which are suffering with the plague. He has 28 animals on the homestead farm, only one of which has shown symptoms of the disease. Both herds are in quarantine.

Benjamin J. Lord, of Woodbury, herd of 25 head. On June 13, six of these animals were suffering with the plague. October 27, there were 21 of these animals sick. On November 25, the same number were suffering with the disease, and were all in quarantine. Of the first lot of 25 animals six were attacked and three died. He then bought four or five fresh animals. These remained in good health for five months and 12 days, but of the original animals 21 had suffered with the contagion.

Camden County.—An occasional case of contagious pleuro-pneumonia had been found here, but no great amount of the disease had ever existed. A most thorough system of inspection of cattle coming from Philadelphia had been established here, and its rigid enforcement had undoubtedly been of great service in preventing the importation and spread of the contagion. From August 28 to December 15, 217 animals, known to have been exposed to infection were returned to Philadelphia. 41 head of these were suffering with plain and unmistakable symptoms of the malady.

Burlington County.—Howard Stakes, West Hampton, herd of 11 head. Quarantined June 20, but does not obey quarantine regulations.

Job Evan, Mount Holly. Herd quarantined July 11. One acute case.

D. Mullone, Recklesstown. Lost one animal on January 20.

William Murray, Jacksonville, herd of 14 head. There have been four acute cases in this herd, and two animals have died. He will probably lose others. The herd was quarantined July 11.

Ocean County.—E. H. Jones, Forked River, herd of 29 head. There have been 27 acute cases in this herd. Six animals were killed on October 2nd, and on the 15th of the same month the balance were slaughtered. The infection to this herd was brought in some calves purchased in Fortieth Street, New York City. From October 1878 to October 1879, Mr. Jones lost 32 animals by this disease.

At the same place as above, Moses Street has one animal, Captain Wilson three, and James Holmer 23, all of which are infected and quarantined.

Mercer County.—G. E. Neunamaker, Pennington. On November 17 three of his animals were suspected. On the 20th of the same month two acute cases had developed, and the herd was quarantined. One animal was slaughtered on January 17. Two animals recovered and are still on the place.

William Walton, Dutch Neck, herd of 32 head. On May 5 one acute case appeared. On May 15 the animal was very sick, and as other cases were developing, the herd was quarantined. The owner did not believe his animals were affected with the plague, and failed to observe the quarantine regulations, until one of the animals was killed, in order to prove the fact. The herd becoming seriously affected, Mr. Walton sold, on October 29, all his animals to a butcher. This herd was infected by a cow purchased in New York. She calved, and her offspring at five weeks' old showed the well-marked lesions of contagious pleuro-pneumonia.

Monmouth County.—D. C. Robinson, West Freehold. One cow died of the plague on May 13. On the 19th of the same month another cow showed symptoms of the disease, and the herd was quarantined. On June 11 three more animals were sick, one of which has since died, and a second one recovered. The quarantine is continued.

A. D. Voorhees, Adams' Station, herd of five head. One of the animals was found sick on October 13, and the herd was quarantined. On the 16th of the same month another animal showed symptoms of disease. One of the afflicted animals was killed. On November 19 a third animal was taken sick. The herd is still in quarantine.

Piny Parks, who resides on an adjoining farm, had a herd of eight animals infected. One was killed, and the remainder quarantined on October 16,

D. W. Watsons, Perth Amboy, herd of 13 head. His herd was quarantined March 29, 1879. October 13, nearly six months after, he still had 11 head. On February 5, 1880, having added to his herd, he had 13 animals, three of which were sick, and the others reported as well (?). The three sick animals were quarantined and the remainder set at large.

Isaac Morris, Metuchen, herd of 14 head. The first case of the plague was discovered in this herd on May 22. The animal was taken to the butcher and killed, and the herd quarantined, which is still continued.

Hunterdon County.—Joseph Exton, Clinton, herd of 51 head. On June 9, 18 of the animals were found suffering with the disease, and were quarantined. The quarantine is still continued.

Morris County.—D. Frank Carl, Sterling, herd of 13 head. On March 26, 11 head were sick. On February 20 but five animals remained, one of these showing old lesions. They are in quarantine.

Benjamin Runion, Millington. Herd of 20 head, 12 of which were sick on June 13, when the animals were quarantined, two animals were killed, and on the 26th of June eight animals were sick out of the 18 remaining. Two new cases had occurred, but the others were improving. The herd is still in quarantine.

Mary Smith, Chambers Street, Newark, herd of five head. On October 24 one animal was reported sick. On the 28th of the same month a second one was attacked, and two were killed. On January 14 the others were reported as "recovered," but were still quarantined.

Alice Kennedy, Roseville, had one animal affected with the plague, which was killed August 14.

Union County.—C. E. Winans, Salem, herd of nine head. Had lost two animals up to August 5. The remainder were sick and in quarantine.

Louis E. Meeker, Salem, herd of thirteen head. Five animals were sick on August 1, when the herd was quarantined. On January 2, having purchased another animal, he had fourteen head. Three of these were chronic cases, and were ordered quarantined for thirty days longer.

J. O'Calligban, Salem, on August 26 had a herd of nine head, with but one animal sick. Up to November 12 he had lost five animals, and had but four left. On January 20 he was visited by the State Inspector, but refused to drive his cattle in from the field for examination. The officer, on threats of personal violence, ordered him to keep up the quarantine, and left without making the examination.

E. A. Bloomfield, Salem, herd of four head, one sick; quarantined August 26. Had one chronic case on January 1; quarantine continued.

F. Saltzman, Raselle, herd of three head; two sick; quarantined September 3. On January 20 one animal was sick, and the herd was still in quarantine.

Bergen County.—C. McMichael, Leonia, herd of 21 head; five sick quarantined April 1. On July 11 had two animals sick, and on January 21 had but five animals left, two of which were sick; quarantine continued.

Christian Freund Closter, herd of ten head; five sick; quarantined November 11. The same report of this herd was made on November 19; it is still in quarantine.

Hudson County.—The disease exists in the following localities:—

Stables Nos. 133 and 144 Essex Street, Jersey City.

Jersey City Heights.—Mary Mullin, No. 106, Thorn Street; J. Lewis, corner Hutten and Sherman Streets; J. Platz, No. 899, Montgomery Street; J. Gurrey, Hopkins Street; Martin Staunton, Hopkins Street; George Reed, No. 87, Germania Avenue; J. Leddy, Nelson and Charles Streets; J. Ryan, No. 25, Laidlaw Avenue; Jonathan Meyer, No. 22, Gardner Street; John Bosch, Congress and Hancock Streets. These localities are all in quarantine.

Greenville.—B. O'Neil, Brittain Avenue; William Shaw, opposite cemetery; Mrs. Corcoran. All quarantined.

Hoboken.—Benjamin Engle, No. 200, Newark Avenue; John Torpey, No. 172, Grand Street; V. Cohen, old small-pox hospital. (Mr. Cohen, having diseased animals, desired a permit to put a fresh cow in his stable. He was refused, but he stated to the officers he should put her in anyway. This he did and I afterwards saw this cow in his stable suffering with the disease in its acute stage.) Michael Reynolds, No. 165, Grand Street.

West Hoboken.—J. Claude, Cortlandt Street; Harris Aaron, Newark Street; H. M. Nass, Hallingen; Mrs. Schmidt, Hackensack Plank Road; B. Benjamin, Cusset Street; Kuntzle, Blume Street; Mrs. Schlooler, Blume Street; Ernest Weiss, Demot Street, and Oldmeyer, Boulevards.

Secaucus.—Latenstein, county road; H. Fisher, Secaucus Road; Loeffle, race course; Bryan Smith, race course; N. Wohlker, race course; H. Block, North Bergen.

Delaware.

The only information I have as to the prevalence of the disease in Delaware I received in the course of a conversation with Mr. George G. Lobdell, president of the Wilmingtod Car Wheel Company. His farm is located in New Castle Hundred, about two miles from Wilmington. In 1858 he had a valuable herd of animals. During this year contagious pleuro-pneumonia broke out among some cattle on a farm about three miles from his place. Fearing the infection of his herd he commenced to sell off his cattle as he could find purchasers, but before this was accomplished, and perhaps within four months, it reached his farm, and by spring he had but one animal left. For two years after this he was without cattle, but at this time he commenced to stock his farm again. About six years ago the disease was introduced into a herd kept on a farm about two miles from his place. His own cattle remained exempt until about two years ago, when they were again infected. Since then he has been using the fumes of burning sulpher and has had no fatal cases. Mr. Lobdell informed me that some sort of a law had been passed by the State looking to a suppression of the disease, and that three commissioners had been appointed by the Governor to superintend and enforce its provisions.

Maryland.

Although it has long been known in a general way that contagious pleuro-pneumonia existed among the cattle of this State, no effort on the part of the authorities has ever been made to ascertain with any exactness the localities of the diseased herds. On the 8th of March I proceeded to Baltimore, where I at once called upon Mr. William B. Sands, editor of the "American Farmer," a gentleman who had greatly interested himself in this matter, and who gave me all the information in his possession as to the localities and extent of the plague in the State, as well as kindly furnishing me with letters of introduction to the officers of the different agricultural societies throughout the State. On the 9th March I visited Hagerstown, the county seat of Washington county, where on the next morning I called upon P. A. Witner, Esq., secretary of the County Agricultural Society. He said he did not believe there was any disease in the county; that upon the day before there had been a meeting of the Board of Agriculture, at which there had been a good representation from all the different sections. Those present agreed that they had never known or heard of a case of lung plague in any part of the county.

I was next introduced to Mr. J. B. Bausman, a cattle dealer of this place. In the pursuit of his business he had been all over the county repeatedly, but had never known of a case of the disease. The drift of cattle in this place was entirely from Western Virginia through to Baltimore—never, so far as he knew, from Baltimore here. In his trade he feels very much the evils of the English embargo. It makes a difference to him of at least $10 per head in the price of his cattle. I then saw Dr. H. J. Cossens, an English veterinary surgeon, who has been located here for the past 15 years, and whose practice extends over the entire county. He had a considerable experience with the lung plague in England, but had never seen but one case in this country; that was many years ago in Virginia. He is sure there is none in this county, nor has there ever been. Several other gentlemen from different localities were seen, but always with the same result. One farmer had a cow, which he had recently bought, that was coughing and not doing well. I visited her and found her suffering from tuberculosis. In the afternoon I proceeded to Frederick city, the county seat of Frederick county. Here, upon the 11th of March I called upon Mr. J. W. Baughman, secretary to the Local Agricultural Society. He did not know of any diseased animals, but took me out to the Court House, where we saw and questioned a number of gentleman from different parts of the county. None of them knew of any cases of this disease; they were very sure that had there been any unusual sickness they would have known of it.

I next saw Dr. P. R. Courtenay, an English veterinary surgeon. He had been here but a comparatively short time and had heard of nothing that caused him to think that there was any of this disease in the county. He kindly offered to bear the matter in mind and if any cases of the disease came to his knowledge he would let me know at once. Here, as in Washington county, the whole drift of cattle is from west to east. In the afternoon I went to Westminster, the county seat of Carroll county, and called upon Colonel W. E. McKillip, president of the county Agricultural Society. He was sure there was no disease of the kind in the county, but he said that it was quite a common thing at certain seasons of the year for cattle to be brought here from Baltimore. This I regarded as a very suspicious circumstance, and so asked for an introduction to some cattle dealers in town. This was kindly granted, and I proceeded to call upon Mr. Edward Lynch. He said:—"Farmers hereabout generally make milk for the " Baltimore market, and procure their cows from among themselves; but from the " time that grass comes up until late in the fall of the year some of them are in the habit " of feeding cattle; that the cattle for this purpose are generally bought at the 'Scales' " in Baltimore; that in this way last fall Mr. Samuel Cover, of Silver Run, this county, " procured some stock which, after having been on his place for a short time, developed " disease of some sort; some died and some that were sick got well. Also a Mr. " Beacham, of Westminster, had had trouble of a similar nature for some time past. In " a general way he knew that the farmers hereabout were somewhat frightened about " contagious pleuro-pneumonia." On March 12 I drove to the farm of Mr. Samuel Cover above referred to, at Silver Run, and found there three cases of chronic contagious pleuro-pneumonia. This gentleman stated that he had got the disease last fall through some steers that came from South-western Virginia, but which had stopped at the Baltimore stock yards for some little time, at which place he had bought them. Some four or five weeks after he got them the disease broke out among them. He had at the time some 80 head of neat stock. Of these 15 were sick. When the disease first showed itself he put all the sick animals in a building by themselves, and had all his stables thoroughly disinfected. This was kept up all the time, and the places repeatedly whitewashed. In all four animals died—two of them the Baltimore steers; the other two were cows which he had had for some time. Mr. Coven further says that now, when he gets cattle, he always puts them by themselves in a building entirely away from his regular cow stables, and hopes in this way to avoid any further outbreak among his herds.

Returning to Baltimore on March 7 in company with Dr. Le May, a veterinary surgeon, I visited a herd of milch cows kept in a dairy in Woodbury near Baltimore. Here we found one acute and two chronic cases of the plague. The man in charge said that he had got through with the disease, from which he had suffered greatly some two months ago, by selling out all his sick animals. From here we went to another large dairy in the same neighbourhood. The gentlemanly owner here informed us that he had had none of the disease for some time; that his plan was to buy often and sell often. In this way he found he could keep up his milking stock and keep rid of disease. From here we visited a near neighbour living on the direct road to the city. In answer to questions this man said that he did not know if his neighbour (the one from whom we had just come) called it having the disease or not, but that he drove many a sick one past his house on his way to the Baltimore market. He (our present informer) was free to say that he followed the same practice himself, and had done so ever since he lost his first eight animals. He supposed this was not right, but his neighbours did it, and so he did. Summer was invariably the worst time thereabouts. The next place visited was about two miles distant and on a different road. The dairyman here had suffered greatly in the past, but thought that now by selling the sick ones he had nearly rid himself of the plague.

March 18.—We drove in several directions around city and found the disease or its effects in all the herds except one that we visited.

March 19.—To-day we examined a number of the cow stables in the city itself, in which many chronic and a few acute cases were found.

March 22.—I went to Harford county, where the disease was reported as existing in a number of different directions. However, we concluded to visit the farm of Senator George A. Williams, whose herd of fine Alderneys have been suffering more or less from the scourge for the past two years. Here among several chronic cases was one that, although he had been sick for some time was making no progress towards a good recovery. This animal the overseer consented to let us kill. The autopsy showed, well marked, the lesions of the disease. The infection here, as with all the other outbreaks hereabouts, came from Baltimore. At this point further investigations were given up for the present, and it still remains, in order to properly finish this report, to make an examination of the remainder of this State, the District of Columbia, and Virginia, in all of which places it is believed that contagious pleuro-pneumonia of cattle exists to a greater or less extent.

What the Investigation shows.

As a result of my investigations thus far I find this ruinous foreign plague actually existing among cattle in the following States:—

Connecticut.—In Fairfax county.

New York.—In New York, Westchester, Putnam, King's and Queen's counties.

New Jersey.—In Atlantic, Gloucester, Camden, Burlington, Ocean, Mercer, Monmouth, Middlesex, Hunterdon Morris, Essex, Union, Bergen, and Hudson counties.

Pennsylvania.—In Philadelphia, Chester, Montgomery, Bucks, Lehigh, Cumberland, York, Delaware, Lancaster, and Adams counties.

Maryland.—In Carroll, Baltimore, Harford and Cecil counties. The middle and south-western portions of this State have not yet been visited.

No examination has as yet been made in the district of Columbia or of the infected territory of Virginia; but as the plague prevailed quite extensively in both of these localities last season, it will no doubt be found still in existence when the investigation takes place.

No. 47.

LETTER from the BRITISH CONSUL-GENERAL to EARL GRANVILLE.

Sanitary, No. 4.

My Lord, British Consulate General, New York, May 1st, 1880.

I have the honour to report to your Lordship in reference to the sanitary condition of cattle in the State of New York, that it appears by the statement just published of Professor Law, one of the State inspectors, that contagious pleuro-pneumonia among cattle is now practically confined to Brooklyn and its suburbs.

In regard to other States in this consular district, I have no further information to communicate to your Lordship beyond that already reported by me.

I have, &c.
(Signed) E. M. ARCHIBALD.

Her Majesty's Principal Secretary of State
for Foreign Affairs, London.

No. 48.

LETTER from the ACTING BRITISH CONSUL at BALTIMORE to EARL GRANVILLE.

Sanitary, No. 5.

My Lord, Baltimore, May 1st, 1880.

I have the honour to report that since my Despatch, Sanitary, No. 4, of April 8, to Lord Salisbury informing his Lordship that a Bill (copy previously enclosed) for the prevention of pleuro-pneumonia amongst cattle in this district, had become a law, some few cases of cattle disease made its appearance and was dealt with by the provisions of the new law. I have the houur to enclose a newspaper paragraph which fully shows how this law went into operation.

I have also the honour to state that owing to the rigour with which the law under which all cattle are slaughtered on arrival at ports in the United Kingdom is carried out, the United States Customs Authorities at this port have discontinued cattle inspections by surgeons who have, until recently, certified as to the health of cattle intended for export.

Cattle for export are brought by railway directly from the west, where pleuro-pneumonia is unknown.

I have, &c.
The Right Hon. the Earl Granville, K.G. (Signed) J. W. LAWFORD,
&c. &c. &c. Acting Consul.

Enclosure in No. 48.

Extract from "Baltimore Sun," April 27, 1880.

Stamping out Pleuro-Pneumonia.

Correspondence of the "Baltimore Sun,"
Belair Md., April 26, 1880.

Slaughter of Cattle in Harford County; Prompt Suppression of the Disease; How it was nipped in the Bud; Interesting Particulars, &c.

At a meeting of the Deer Creek Farmers' Club of Harford County, on Saturday last, the subject of pleuro-pneumonia was considered, in connexion with other matters of interest to farmers. The meeting was held at the house of the president of the club, Mr. Jas. Lee, and was largely attended. The farmers present were as follows: James Lee, Benjamin Silver, junior, R. H. Archer, B. H. Barnes, G. R. Glasgow, Thos. A. Hays, Wm. Hays, Johns H. Janney, W. D. Lee, Thos. Lochary, John Moores, Wm. Munnikhuysen, George E. Silver, Silas B. Silver, S. M. Lee, Judge J. D. Watters, Herman Stump, R. E. Morgan, W. S. Forwood, M. T. Murphy, Parker H. Lee, Dr. J. M. Magraw, and F. W. Baker, editor of the "Ægis."

These names comprise some of the most influential and snbstantial farmers of the county, owning some of the richest lands under tillage, and representing a wide area of country. It was stated that the members of the club own collectively upwards of a thousand head of horned cattle, so that they are of course deeply interested in the protection of their stock from any and all contagious diseases. The Deer Creek region is considered the richest as well as the best cultivated part of Harford county; it certainly possesses beautiful lands, which are under the highest cultivation. The country is gently rolling; the homesteads are excellent and give exterior as well as interior evidences of the thrift and prosperity of an energetic and affluent race of people.

One of the preliminaries of the club meeting was to inspect the farm and barnyard of Mr. Lee, who is known to be one of the most successful agriculturists of this State, in order that the committee might report and the meeting discuss any particular subject suggested by the inspection. It was ascertained that Mr. Lee devotes much attention to stock raising. He has two short-horn cows, "Mary Leslie" and "Lady Hendleston," which are models, perfect in form and condition. He has also two fine bull yearlings of the same blood, besides other short-horn cattle originally derived from L. H. Long, of Kentucky. Besides other stock he has upwards of sixty horned cattle, chiefly short horns. Besides the blooded stock the stalls were found filled with beef cattle, which have been fed all the winter and are now ready for market. Corn used for winter fattening of cattle realizes greater profit to the producer than if sold as grain. Probably the most satisfactory inspection of Mr. Lee's farm was made in the dining-room, however, where the table demonstrated most agreeable excellence, which all the guests knew how to appreciate as well as the points of the short horns.

So far no pleuro-pneumonia has manifested itself among the cattle of the Deer Creek region, which is not far from the Pennyslvania line. Each member of the Farmers' Club was questioned by the president on the subject, and they all answered that no disease of the kind had appeared among their cattle or in their immediate neighbourhood. That contagious and fatal pleuro-pneumonia had existed in other portions of the country is incontestable, but that the surest means have been employed to stamp it out is also equally true, so that at this time it may be truly said none is known to exist in Harford. The wisdom of the act of the Legislature at its late session, providing the means of controlling the murrain, is acknowledged on all sides, and the power vested in the executive has been most wisely exercised.

Governor Hamilton commissioned Honourable Herman Stump, President of the Senate, six days after the expiration of the late session of the Legislature, to investigate the pleuro-pneumonia in Harford. Subsequently, Captain E. W. Gallup, tenant of the Dairy Farm property, belonging to the Citizens' Bank of Baltimore, and situated about nine miles from Belair, reported to the Governor that pleuro-pneumonia had appeared on his premises, and he asked for the application of the remedies which the law prescribes.

Senator Stump designated Dr. James M. Magraw to inspect the cattle at the "Dairy Farm." Dr. Magraw is a well known and skilful practitioner of medicine, who also possesses veterinary knowledge and the well-placed confidence of the community where he practices. After a careful examination of Gallup's cattle he reported the existence of pleuro-pneumonia in the herd. The fact was telegraphed to Annapolis, and the slaughter of the cattle on the place, twenty-two in number, was sanctioned. Four other cattle, which had herded with these, were traced up, two were killed, and two others will share the same fate, though neither of them betrayed any signs of actual disease.

Preliminary to the extirpation of the Gallup herd, Dr. Magraw had one of the diseased cows slaughtered for dissection. The lungs were found to be solidified, and, as in the case of pleurisy, adhering to the sides. Among the witnesses of the post-mortem were Hon. Herman Stump, James Lee, John Moores, Alexander M. Fulford, Dr. James T. Billingslea, W. Smithson Forwood, Joseph A. Price, E. A. Gallup, John C. Davison, Henry Fulford, Wm. P. Trimble, Gabriel Christy, R. Emory Taylor, G. W. Hanway, W. R. Cunningham, Thomas A. Hays, John B. Price and others. No doubt existed in the minds of these gentleman as to the true nature of the malady.

While the Act of Assembly does not provide compensation for diseased cattle which may be killed, those not actually diseased, slaughtered to prevent the spread of the contagion, are to be appraised and reported to the next General Assembly, with the view of reimbursing the owners, should provision be then made for that purpose by law. For all other expenses the Governor has immediate and ample authority. The appraisers for the Gallup cattle were Messrs. John Moores and James Lee.

Dr. Magraw, after due examination, reported at the farmers' meeting that there is now no evidence of pleuro-pneumonia among the Alderneys at Ranger's Lodge, the farm of State Senator George H. Williams. Dr. Magraw said the disease may have shown itself there, but he has seen no evidence of it. Before this visit to the premises, a steer had been killed by a veterinary surgeon, and the lungs were carried away to Baltimore, but he only saw the hide and carcass, so that there was nothing left by which to form a judgment. No cases of *actual disease* have been discovered in the county, except on the Dairy Farm and the Ranger's Lodge estate, and in both cases every precaution has been taken at a favourable time to prevent the spread of the contagion. The Dairy Farm is isolated in a great measure. It contains nearly one thousand acres, and is bounded on the south by Bush river, on the east by Church creek, and on the west the farm of Mr. Charles A. McGaw separates it from Bush creek. There is no disease upon Mr. McGaw's farm. No public road passes through it, and the nearest thoroughfare is the old post-road along which, in olden times, four-horse stage coaches conveyed passengers between Baltimore and Philadelphia. This road is several miles distant from the field where Gallup's cattle were kept, and separated therefrom by a large body of Woodland. It is therefore not at all probable that it has spread, and now that the cattle are destroyed, of course all danger is over from that quarter.

It was realized in good time that everything depended upon stamping out the disease while it could be controlled, and while the cattle were yet herded in the barn-yards before they were turned out to pasture, where the chances would be greater of its wide dissemination.

Following up the enforcement of the law on Gallup's herd, the Secretary of State wrote to Senator Stump, April 23rd, to the effect that on account of complaints received from the Governor of Pennsylvania Governor Hamilton had directed such other action to be taken in Harford county as the exigencies of the case demanded, within the limitation of instructions heretofore given. But as all the cases of pleuro-pneumonia that could be discovered in Harford have been disposed of, and suspected cattle have been placed under surveillance and in quarantine, very little now remains to be done so far as this county is concerned.

Details of the operations of the commission in Harford county are reported officially as follows:—On the 21st of April instant Dr. Magraw slaughtered 22 cattle belonging to E. W. Gallop, of which five were diseased and 17 healthy animals. Those considered sound were in bad condition and looking thin. Those affected when slaughtered were four cows and one steer. The animals exempt from disease which were killed included five cows, one bull, two oxen, two steers, and four yearlings.

Mr. Gallup reports that he bought 30 steers at the Calverton stock yards, Baltimore, September 19th, 1879. One Steer died November 24th, 1879; five or six were slightly affected at the same time with cough and other symptoms, but pleuro-pneumonia was not suspected until the steer died. Another steer died December 20, the symptoms being the same as in the case of the steer which died November 24. Two cows seriously affected were killed about the same time. All the affected cattle were treated with turpentine and other counter irritants. Two recovered. Thinking the disease had subsided, Mr. Gallup sold 28 head of steers at Calverton, December 21, 1879. The disease disappeared from the Dairy Farm precincts until January 24, 1880, when one cow died. No other cases appeared until about three weeks ago. Since January 24, four head of cattle have died or were killed. Four cows were sold to Taylor Pyle, in Chester county, Pa., a dealer, who lost a number of animals.

Mr. Gallup states that since September 19, 1879, he has lost 17 head of cattle by death or slaughter, not including the 22 despatched under the provisions of the law. Three steers were also sold from this place to Thos. Morgan, by whom they were sold to Philadelphia butchers.

On the 21st instant Dr. Magraw slaughtered two cows belonging to William E. Cromwell, coloured, which were exempt from disease, but had herded with the Gallup stock. Two others, belonging to Wesley Gallion, had also wintered with Mr. Gallup's cattle, and were removed three or four weeks ago. Dr. Magraw has examined one of them at Abingdon, and finding it apparently sound, ordered it to be quarantined for two weeks to await results. The other, at Aberdeen, will be killed.

No. 49.

LETTER from the ACTING BRITISH CONSUL at BALTIMORE to EARL GRANVILLE.

Sanitary No. 6.

My Lord,

Baltimore, June 1st, 1880.

I have the honour to report that since my Despatch, Sanitary No. 5 of the 1st ultimo, some few cases of pleuro-pneumonia appeared amongst the cattle of this city, but every precaution was adopted by the authorities under operation of the new law, to check the spread of the disease. The affected cattle were found to be in stables of bad condition, poorly ventilated, and dirty, and the animals continually confined to the stable, fed on grain and swill slops from the breweries.

The disease was generally of a mild type, and did not necessitate the slaughter of the cows, and the fresh pasturage ordered to them proved beneficial.

The great trouble in managing this disease is owing to the owners of the cattle. As soon as they are found to be affected, they sell off their stock and thus spread the disease. Men are known to have sold milk from diseased kine, and in numerous cases the buyers were aware of the condition of the stock, but, as they purchased at cheap rates they took the risk with the expectation of curing them.

Cattle from this vicinity are never taken for export to the United Kingdom, but are brought on directly from the Western States where pleuro-pneumonia is comparatively unknown. The stock thus brought on have no delays in transit until they are driven on shipboard.

I have the honour to enclose herewith a newspaper paragraph giving the full text of the law upon this subject as adopted by the late legislation of this State, and which has been published according to law for the guidance of those interested and concerned.

I have, &c.
(Signed) T. W. LAWFORD,
Acting Consul.

The Right Hon. the Earl Granville K.G.
&c. &c. &c.

Enclosure in No. 49.

The Baltimore "Sun" newspaper of May 5, 1880.

PLEURO-PNEUMONIA AMONG CATTLE.

An ACT to prevent the SPREAD of INFECTIOUS or CONTAGIOUS PLEURO-PNEUMONIA among the CATTLE of this STATE.

Section 1. Be it enacted by the General Assembly of Maryland, that whenever it shall be brought to the notice of the Governor of this State that the disease known as contagious or infectious pleuro-pneumonia exists among the cattle in any of the counties of this State or in the City of Baltimore, it shall be his duty to take measures to promptly suppress the disease and prevent it from spreading.

Section 2. And be it enacted, that for such purpose the Governor shall have power to issue his proclamation stating that infectious or contagious disease exists in any county or counties of the State, or in the City of Baltimore, and warning all persons to seclude all animals in their possession that are affected with such disease or have been exposed to the infection or contagion thereof, and ordering all persons to take such precautions against the spreading of such disease as the nature thereof may, in his judgment, render necessary or expedient; to order that any premises, farm or farms, or stables where such disease exists or has existed, be put in quarantine, so that no domestic animal be removed from or brought to the premises or places so quarantined, and to prescribe such regulations as he may judge necessary or expedient to prevent infection or contagion being communicated in any way from the places so quarantined; to call upon all sheriffs and deputy sheriffs to carry out and enforce the provisions of such proclamations, orders and regulations, and it shall be the duty of all sheriffs and deputy sheriffs to obey and observe all orders and instruction which they may receive from the Governor in the premises; to employ such and so many medical and veterinary practitioners and such other persons as he may from time to time deem necessary to assist him in performing his duty as set forth in the first section of this Act, and to fix their compensation; to order all or any animals coming into the State to be detained at any place or places for the purpose of inspection and examination; provided, that animals coming from a neighbouring State, that have passed a veterinary examination in said State, and have been quarantined and discharged, shall not be subject to the provisions of this Act; to prescribe regulations for the destruction of animals afflicted with infectious or contagious disease, or of those in direct contact with such and liable to spread the disease, and for the proper disposition of their hides and carcasses, and of all objects which might convey infection or contagion; provided, that no animal shall be destroyed unless first examined by a medical or veterinary practitioner in the employ of the Governor as aforesaid; to prescribe regulations for the disinfection of all premises, buildings and railway cars, and of all objects from or by which infection or contagion may take place or be conveyed; to alter and modify from time to time, as he may deem expedient, the terms of all such proclamations, orders and regulations, and to cancel or withdraw the same at any time.

Section 3. And be it enacted, that any person who shall transgress the terms or requirements of any proclamation, order or regulation issued or prescribed by the Governor, under the authority of this Act, shall be deemed guilty of a misdemeanor.

Section 4. And be it enacted, that any person who shall sell or otherwise dispose of an animal which he knows, or has reason to believe, is affected by the disease, or has been exposed to the same, shall forfeit to the State not less than $50 nor more than $100.

Section 5. And be it enacted, that all the necessary expenses incurred under direction or by authority of the Governor in carrying out the provisions of this Act shall be paid by the treasurer out of any moneys not otherwise appropriated, and upon the warrant of the comptroller, on being certified as correct by the Governor.

Section 6. And be it enacted, that in the event of its being deemed necessary by the Governor, or any agent duly appointed by him under the provisions of this Act, to prevent the spread of contagion or infection, to cause any animal or animals not actually diseased to be slaughtered, the value of such animal or animals shall be fairly appraised and a record kept, and a report made thereof to the General Assembly at its session next ensuing, with a view to the reimbursement of the owners of such animals so killed, should provision therefore be made by law, it being provided that the carcasses of animals so killed, and found entirely free from disease, shall, if practicable, be sold, and the proceeds of such sale shall be paid over to the respective owners of the cattle, and the amounts so received and paid over noted against the appraised value thereof.

Section 7. And be it enacted, that this Act shall take effect from the date of its passage.

Herman Stump, Jr.,
President of the Senate.
Hiram McCullough,
Speaker of the House of Delegates.

Approved April 10, 1880.

Wm. T. Hamilton,
Governor of Maryland.

We hereby certify that the aforegoing is a correct copy of an Act of the General Assembly of Maryland, passed at the January Session, 1880.

Eugene Higgins,
Secretary of the Senate.
Milton Y. Kidd,
Chief Clerk of the House of Delegates.

No. 50.

LETTER from the ACTING BRITISH CONSUL GENERAL at NEW YORK to EARL GRANVILLE.

Sanitary No. 5.

British Consulate General, New York,
June 1st, 1880.

My Lord,

I have the honour to report to your Lordship that since the date of my last Despatch (Sanitary, No. 4, of the 1st ultimo) pleuro-pneumonia has again manifested itself among cattle on Staten Island, in New York Harbour. Measures have, however, been taken by the State inspector which it is hoped will effectually prevent the spread of the disease.

The sanitary condition of cattle in other parts of this consular district is about the same as previously reported.

I have, &c.,
(Signed) PIERREPONT EDWARDS,
Acting Consul General.

Her Majesty's Principal Secretary of State
for Foreign Affairs, London.

No. 51.

LETTER from the BRITISH CONSUL-GENERAL at NEW YORK to EARL GRANVILLE.

Sanitary, No. 6.

British Consulate General, New York,
July 1st, 1810.

My Lord,

I have the honour to report to your Lordship that the sanitary condition of cattle in this consular district, as reported by Acting Consul General Edwards Despatch (Sanitary, No. 5) of the 1st ultimo, remains practically unchanged.

I have, &c.,
(Signed) E. M. ARCHIBALD.

Her Majesty's Principal Secretary of State
for Foreign Affairs, London.

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THE NORTHAMPTONSHIRE COMBINATION OF SANITARY AUTHORITIES.

Medical Officer of Health's Annual Report. (Part I.)

REPORT

ON THE GEOGRAPHICAL DISTRIBUTION OF

FEVER

("TYPHUS" OF THE REGISTRAR GENERAL)

FOR THE TWO DECENNIAL PERIODS 1851—60, 1861—70.

WITHIN THE AREA OF THE COMBINED

SANITARY AUTHORITIES,

IN THE COUNTIES OF

NORTHAMPTON, LEICESTER, RUTLAND, AND BUCKS.

Read at a Quarterly MEETING of DELEGATES, held at the County Hall, Northampton,
on SATURDAY, JULY 11, 1874, by

ALFRED HAVILAND,

Medical Officer of Health to the above Sanitary Authorities.

ILLUSTRATED BY TWO COLOURED MAPS.

DELEGATES PRESENT:

W. G. DUNCAN, ESQ., VICE-CHAIRMAN, PRESIDED.

THE HON. PERCY BARRINGTON,	REV. A. BOODLE,
REV. G. L. W. FAUQUIER,	CAPTAIN RICKETT,
W. ADKINS, ESQ.,	R. H. HEWITT, ESQ.,
G. W. EDMUNDS, ESQ.,	W. WALKER, ESQ.,
R. RICHARDSON, ESQ.	

PRICE TWO SHILLINGS.

PUBLISHERS—
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NORTHAMPTON: MARK DORMAN.

ERRATA.

Page 10, line 2, add "shire" to "Northampton."
" " 26, after "average" omit "annual." and read "540" instead of "270"
" " 44, instead of "one thousand and two" read "252."
" " 47, instead of "belongs" read "belonged in 1851-60."
" 11, " 3, instead of "eight hundred and forty" read "two hundred and eighty."
" " 22, instead of "1,144" and "114·4" read "911" or "91·1."
" " 21, instead of "190" read "152."'
" " 25, instead of "£5,000" (£4,040) read "£3,952."

LIST OF DELEGATES ON THE TITLE-PAGE.

Instead of "G. W. Edmunds" read "George M. Edmonds."

In publishing the first part of my Annual Report, it will be necessary for me to make some remarks on the form in which it appears. In consequence of the Delegates of the Combined Sanitary Authorities having decided not to pay the expenses of publishing my Annual Report, I have been under the necessity of re-printing it from the *Northampton Mercury*, with the same type that was used by that journal—which, although admirably adapted for newspaper purposes, is inferior to that ordinarily used for the Medical Officers' of Health Reports throughout the Kingdom. As, however, the expense has to be borne by one individual instead of by the ratepayers, whom it mainly interests, I do not think under the circumstances mentioned, that I am called upon to apologise for the form.

I have added a summary of my Report, which is descriptive of the two coloured maps that illustrate the Geographical Distribution of Fever throughout Northamptonshire, and the Combined Districts in the Counties of Leicester, Rutland, and Bucks, during the twenty years—1851-70. I have charged two shillings for each copy in order to defray the bare expenses of printing, lithographing, and publishing.

A. H.

Northampton,
19*th September,* 1874.

TABLE II.

Average Annual Proportion of Deaths from specified Causes, at specified Ages, in England generally, and in each Registration District within the Northamptonshire Combined Sanitary Area, during the Decennial Period: 1861–70.

Population at all Ages		DIVISION OR DISTRICT.		DEATHS PER 100,000 LIVING OF EACH CLASS REFERRED TO.																
				At all Ages.					At less than 1 year of age	At less than 5 years of age.							At Ages between 15 and 55.			
																	Phthisis. Pulmonalis.		Other Diseases of Respiratory Organs.	
1861.	1871.	No.	Name.	All Causes.	Fever "Typhus" of the Registrar Genl.	Diarrhœa, Dysentry and Cholera.	Scarlatina.	Diphtheria.	All Causes.	All Causes.	Diarrhœa, Dysentry and Cholera.	Diseases of the Respiratory Organs, including Phthisis.	Small Pox.	Scarlatina	Measles.	Whooping Cough.	Males.	Females.	Males.	Females.
20,066,224	22,712,266	—	**ENGLAND AND WALES.** ...	2,242	88	108	97	18	18041	6,830	598	1,104	65	462	300	377	368	374	132	91
1,295,497	1,442,654	III.	South Midland Counties	2,017	74	91	72	17	16,549	5,703	503	905	39	328	227	283	318	354	92	62
231,079	248,234	10	*Northamptonshire*	2,037	81	73	77	15	17,396	6,113	381	975	48	350	298	250	258	374	75	64
13,471	13,512	165	Brackley	1,957	109	37	47	11	14,543	4,981	99	809	11	259	281	171	239	409	80	44
13,004	12,987	165	Towcester	2,043	47	59	35	13	18,333	6,207	351	1,189	54	214	315	262	233	315	69	99
11,632	11,717	166	Potterspury	1,883	69	55	45	11	16,612	5,999	299	1,021	—	254	371	273	251	343	60	47
9,928	10,659	167	Hardingstone	2,017	77	78	98	12	16,519	5,835	471	1,150	28	402	305	159	256	512	39	60
41,160	50,743	168	Northampton ... ...H.L.	2,519	76	177	162	21	22,308	8,840	1,090	1,296	305	722	508	387	382	402	101	79
20,600	19,452	169	Daventry	1,951	67	46	45	15	15,653	5,072	191	902	39	223	133	176	233	372	92	84
24,224	28,998	171	Wellingborough	2,110	89	88	78	14	19,474	6,825	476	1,119	48	330	425	327	270	388	75	63
14,065	14,349	173	Thrapston	1,988	77	69	55	8	17,631	5,942	311	964	20	208	267	331	227	369	101	82
15,463	14,619	174	Oundle	1,869	64	43	72	9	15,735	4,835	123	612	5	271	163	257	239	355	71	66
147,207	155,007	8	*Buckinghamshire*	2,022	70	71	70	16	15,837	5,517	355	921	14	324	203	252	304	374	88	49
24,855	25,867	153	Newport Pagnell	1,989	69	64	32	1	15,617	5,514	289	1,150	11	166	292	200	259	367	92	54
1,288,928	1,406,935	VII.	North Midland Counties	2,084	79	91	73	20	18,173	6,132	500	896	39	343	233	271	296	413	94	68
243,648	275,171	28	*Leicestershire*	2,006	70	91	51	14	17,796	5,946	492	906	30	285	268	245	358	375	85	60
16,059	16,081	409	Market Harborough	1,864	54	68	29	15	17,186	5,339	356	818	19	135	323	241	262	351	64	48
23,479	23,385	29	*Rutlandshire*	1,899	63	65	86	17	14,420	4,090	280	589	9	385	166	250	270	372	90	79
12,367	12,243	420	Uppingham	1,846	54	47	90	13	13,939	4,632	222	604	19	445	222	210	228	368	94	76
			Uncombined Districts—County of Northampton																	
15,359	13,866	170	Brixworth	1,919	112	63	96	13	15,778	5,211	293	957	26	412	221	257	252	306	74	50
18,995	20,113	172	Kettering	2,083	104	78	100	16	18,043	6,431	384	903	7	461	355	197	225	388	75	52
33,178	37,219	175	Peterborough	2,012	90	92	98	38	18,131	5,982	491	869	38	417	235	213	288	335	63	46

PRELIMINARY MEDICAL

Report on Typhoid Fever.

To the Chairman and Members of the Central Committee of Delegates from the combined Sanitary Authorites in the Counties of Northampton, Leicester, Rutland, and Bucks.

Gentlemen,—You will remember that at the last quarterly meeting of your committee, I had engaged to make my annual report; but, that in consequence of its voluminous character, it was thought advisable that I should make an abstract of it, and publish it in the county papers. There were, however, difficulties in the way, and I have thought it more respectful to you to select the most important subject, and present it to you on this occasion. The following report, after reading it to you, I shall present to the President of the Local Government Board, and from time to time supplement it with appendices, which will contain special reports on each Sanitary District, and the various subjects involved in the Sanitary history of my area. It is absolutely necessary for the guidance of the Medical Officer that he should be thoroughly informed not only of the present state of the general health of the area over which he has supervision, but that he should be supplied with the means of ascertaining what have been the prevalent causes of premature death for at least ten years before the Public Health Act of 1872 came into operation: for without this knowledge, it would in the first-place be impossible for him to judge of the effects of carrying out the provisions of the Act, and in the second, he would lose much valuable time if he solely depended upon his own personal experience unaided by the invaluable records of the Registrar General. So necessary have I thought it that we should know how we start on our mission, as regards the relative mortality within our districts from the several causes of death registered, that I have collated the proportional mortality to every 100,000 living of eleven different causes of death during the ten years 1861-1870; and in order to present the matter to you in the most complete form I have included the three districts which are not within my combined area, viz., Peterborough, Kettering, and Brixworth; by doing so, the geographical distribution of disease throughout Northamptonshire is not only made more complete, but the uncombined districts are made to afford illustrations of conditions, both climatic and social, which will materially aid us in solving some of the difficult problems with which we have to deal. I have illustrated the vital statistics of your combined sanitary area, by a series of seventeen maps, which are so coloured as to give at a glance the relative mortality from specified causes in each registration district within the Northamptonshire combined Sanitary area, during the decennial period 1861-70. The degrees of mortality are six in number, those above the average for all England are coloured blue of three different shades, the deepest indicating the highest mortality, those below the average coloured red, the deepest being the first or lowest degree of mortality. I commence with Fever, under which head the Registrar General has included not only Typhus but Typhoid, that form which hitherto has been unfortunately ever present amongst us, but which is perhaps one of the most easily preventable of the many causes of death with which we have to deal. During the decennial period 1851-60, the average annual rate of mortality from this cause was 91 to every 100,000 living, and 88 during the next ten years ending December 31st, 1870, indicating an improvement, which I think may be very fairly attributed to the several Sanitary Acts that have come into operation during the latter period. This fact, however small, is highly significant, and calculated to give us great hope that at the end of the next quin-quennial or decennial period a still further reduction in the mortality from this cause will be observed, and that a time will come when Typhoid Fever and its allied forms, shall cease to exist. This time, however, will be indefinitely postponed, unless the Rural Sanitary Authorities have increased powers given to them, equivalent at least to those now enjoyed by the Urban, and every loop-hole in the present Public Health Act filled up by decisive terms. The "may" must be converted into "must" and "shall"; and amongst many other things it must be made imperative upon every Sanitary Authority to appoint a responsible Sanitary Committee with full powers to act. Typhoid Fever is generally contracted in three ways, viz., by drinking water contaminated with the fever poison, by sewer gases, and by contagion. I believe that the disease and death returns of Typhoid Fever are the best indicators we have of the sanitary condition of any place, whether in the town or the country. I shall, therefore, in giving you the statistics of this preventable cause of death, also add, as we proceed, any observations that I may deem worthy of your consideration on the general causes of this and other diseases, and on the best means of removing them. A glance at the coloured maps of the combined area will show that only four out of the twelve Union Districts during the ten years 1861-1870 reached the second degree of mortality—these were Oundle, Uppingham, Market Harborough, and Towcester, 50 to 60 to 100,000. All the rest being either only just below the average for all England (88) or else above it, as in the case of Wellingborough and Brackley, which last is conspicuous by its high mortality of the 5th degree. If we compare the mortality which obtained in the preceeding decennial period with that of the one we are discussing, we shall find some very remarkable facts—for instance, the mortality from fever in the Wellingborough District had an annual average of 159 to every 100,000 living, whereas in 1861-70 it was reduced to 89 or nearly 47 per cent. The only two districts which showed an increase in mortality were Newport Pagnell and Uppingham. It must, however, be remembered that their mortality in the earlier decade was the lowest of the twelve districts, viz., 66 and 45 respectively, the average for the 12 districts being 105·7, or 34·7 to every 100,000 less than during 1851-60. For particulars I must refer you to Table 1. The difference between the mortality in the uncombined districts of Brixworth, Kettering, and Peterborough is not so assuring, being only 14·2, or less than 50 per cent. below the others. Since 1855 the Nuisance Removal Act has been more or less in operation, and I feel convinced that much has been effected. In Towcester there is a decrease of more than 50 per cent. (53) in the mortality from this one cause since the decade 1851-60. During the year 1873 there have been one hundred and four deaths from fever within my sanitary area, which were distributed as follows: Brackley, 5; Towcester, 9; Potterspury, 6; Hardingstone, 7; Northampton, 23; Daventry, 3; Wellingborough, 14; Thrapstone, 10; Oundle, 5; Newport Pagnell, 10; Market Harborough, 5; and Uppingham, 7.

In BRACKLEY the cases, as at Syresham and Newbottle could be easily traced to well contamination. In this district we have the great-oolite and the Northampton sand capping the upper lias clay, as at Brackley and Syresham: within the Eastern portion of this district's water shed arise the sources of the Nen and the Ouse, the valleys of which are characterised by the upper lias clay; in the Western water shed, where are to be found the sources of the river Cherwell, the high lands are upper lias, and the excavated valleys, the middle lias or marlstone. Typhoid Fever has been almost exclusively confined to the Eastern water shed. I earnestly recommend the Sanitary Authority of this and other districts to discountenance the use of cess-pits, and water closets as far as practicable, and adopt the ash or earth closet system wherever it is deemed advisable to reconstruct privies. I have examined the water-supply of nearly every village within this district, and can safely say that whilst nature has been most beneficent in this respect, man has by his social contrivances of cess-pits and pig-styes, exerted a most maleficent effect upon her gift. The area of Brackley in statute acres is 58,769; in 1871, it contained 3,056 inhabited houses, and a population of 13,512 persons, of whom 6,641 were males, and 6,871 females. During the decennial period 1860-71, its average annual death rate was 22·42 to every 1000 living. In 1873, the number of deaths from Fever were in the sub-district of Brackley 4, and in that of Sulgrave 1.

In TOWCESTER the number of deaths from Fever in 1873 were 9; 5 in the sub-district of Abthorpe, and 4 in that of Towcester. The out-break of Typhoid Fever in Maidford I have fully laid before you, and have nothing to add except that after a considerable and injudicious delay, a new well is about to be sunk. Towcester itself possesses an immense nuisance in the town drainage, which pours itself into the river Tove close to the town. The Sanitary Committee were perfectly willing under my advice to remedy the evil, but their good intentions were frustrated by a legal difficulty, which, however, I hope at some future time, will be done away with. The district of Towcester contains the confluence of the sources of the river Tove, which, from their origin being situated on high clay lands are liable to receive suddenly large quantities of water after a heavy rain storm, the consequence of which is the flooding of the riparial meadows and the town of Towcester, the health of which is materially affected thereby. In my report on the flooding at Towcester I have drawn attention to the necessity of removing one of the causes of the flooding both of the main stream and the tributaries, by the excessive growth of water weeds, which, combined with the tortuous course of these streams, greatly contributes to the disasters complained of. These floods greatly reduce the temperature of the valleys and the exhalations from the flooded lands after subsidence of the waters are calculated to lower the vitality of those living within their influence. Mr. Watkins, surgeon, of Towcester, on the occasion of my reading my report made some valuable remarks based upon personal observations, as to the effects of straightening these tortuous streams for railway purposes. He remarked that on a still night, the difference of the temperature of the atmosphere above the land where free channels had been made, compared with that over the tortuous and weedy streams was very marked and strikingly perceptible during a rapid passage through them, the temperature of the air over the land through which the free channels ran being several degrees higher than that over the natural courses. Whilst on this subject, I may as well allude to the flooding which seasonally occurs along the banks of the river Nene. I feel convinced that it is a fruitful source of disease, although perhaps a form of disease that cannot well be defined, except that I believe much of the rheumatism prevalent in the Nene valley is attributable to this cause. Again, on looking at the map of the distribution of consumption, especially in females, it is noteworthy that this cause of death operates so as to raise the mortality above that of the whole of England in the riparial districts of Hardingstone, Northampton, and Wellingborough. I will not say that this seasonal flooding and consequent chilling of an atmosphere already exposed to Easterly and North Easterly winds, are the only causes of this excessive death rate; for I am too well aware that a most efficient factor in these districts is to be found in over-crowding. At the same time I do think it a matter for grave consideration, and I certainly cannot help suggesting that if the mills were partially, or still better, wholly done away with, and some of the bridges modified, so as to admit of a greater freedom of current during seasons of heavy rains, that the floods would be reduced to a minimum, and the temperature of the valley considerably raised, which in itself would modify the climate so as to render the prevalent diseases, especially consumption, less fatal than the Registrar-General's figures for more than thirty years have proved them to be. The district of Towcester has an area of 42,216 statute acres, which, however, is disputed to a certain extent. In 1871 the number of inhabited houses was 2,986, its population 12,987, of whom 6,389 were males, and 6,598 were females. The geological characteristics of this district are the great oolite, ironstone, and upper lias clay along the valleys of the tributaries of the Tove, and these formations with the middle lias superadded along the source of the River Nene in the northern part of this district. During the decennial period 1851-60 the mortality from fever amounted to 100 to every 100,000 living; during that of 1861—70, 47; and during 1873, 63, which is 10 less than the mean of the twenty years 1851-70, although in excess of the last decennial period 1861-70 by 16. I must remark, however, that the death rate from typhoid is not a criterion of the amount of cases from that cause as was instanced in Maidford, where, although there were a large number of cases (36), no death occurred strictly traceable, as a primary cause, to this disease.

POTTERSPURY contains the junction of the Rivers Tove and

Ouse, the former of which has made its course through the great oolite down to the upper lias clay, the former formation being over a wide area covered by blue drift clay, which, to a great extent, protects the water from contamination. The deaths from typhoid fever were during 1873, 6, or 42 to every 100,000 living in 1871; here again polluted water, as at Deanshanger, was the grand cause. In the ten years 1851-60 there were 110 deaths to every 100,000 living; and during 1861-70 69, so that the difference was 41, or one less than that which obtained last year.

In Hardingstone Union district the death rate from fever was in 1851-60 132; in 1861-70 77; and in 1873 60 to every 100,000 living. These figures show a great advance; still there is room for great improvement. In Milton fever has ever been rife, and this cannot be wondered at, when we take into consideration the sanitary arrangements which I have already laid before you. In Hardingstone parish fever was imported from the union district of Brixworth, where in the parish of Moulton typhoid fever was so prevalent during nearly the whole of last year. The first case was imported into a school where the boy died. The servant of the house paid a visit to the corpse whilst it was laid out, fell ill, and died at home of tpyhoid fever. Thorough disinfection was then ordered, and upon the statement of the mistress was said to have been thoroughly accomplished according to the directions of myself and inspector. After a time the school was re-opened, and a young gentleman from Northampton was admitted, soon after which he sickened, and returned home to die of typhoid fever. He had slept upon the bed whereon the first case had died. This sad case, however painful it may be to record, is an instructive one, and will act as a warning to medical officers and sanitary inspectors, never to trust to the statements of interested persons, whether schoolmasters or schoolmistresses, as to disinfection after the occurrence of infectious diseases, but to see for themselves that the orders are actually carried out within their presence. I believe that in many instances the privy accommodation in schools is very deficient, and will demand in future rigid inspection. Hardingstone is characterised by the great oolite and Northampton sand and upper lias generally, and to the west by the middle lias or marlstone. Hardingstone contains 32,677 statute acres, and in 1871 there were within this district 2,307 inhabited houses, and a population of 10,659, 5,352 of which were males, and 5,307 females. The cases of typhoid fever were all traceable to polluted water; much has been done to rectify this evil, but still much remains. The water course at the junction of the London and North-Western and Midland lines, into which the drainage from the area under the Local Board of Hardingstone finds its way is still an intolerable nuisance, but I trust that before long means will be taken to rectify it. I have recommended the tub system and regular scavenging in Cotton End and Far Cotton area as the only remedy in the absence of a system of drainage that may be deemed practicable. The Local Board of Hardingstone is about to undergo a change by the addition of St. James's End, and when the new Board is constituted I hope that this glaring nuisance will at once command their earnest attention. There is much overcrowding in this district, and this social condition must be considered a powerful factor, not only in the causation of fever, but of consumption also. The cases of death from fever occurred as follows in the sub-districts during 1873:—In Brafield, two cases; in Hardingstone, four; and in Milton, one.

Northampton.—During the ten years 1851-60, the deaths in Northampton Union district from fever were largely in excess of the average. This was a period in which a great number of private wells were in use in the town, and when the water supplied by the Northampton Company had not as yet been adopted so generally as it was during the next ten years. Northampton being situated on the sand which bears its name, and which lies on the upper lias clay, at the junction of which are found the springs which supply the wells, it was fortunate that, before the town so greatly increased, a company was formed to supply it with water from an independent source. In fact, it is very significant that Northampton, during the ten years 1861-70, had a mortality from fever lower than the average annual death-rate from this cause throughout England. In 1873 Northampton had a lower death rate from fever than Towcester, Hardingstone, Thrapston, and Uppingham the figures being respectively 49, 69, 60, 69, and 57 to every 100,000 living. The Northampton water supply is an institution of which the inhabitants might be justly proud; it has saved many hundreds of lives, and consequently much pauper money. Would that every village within my area, nay, all over England, could be supplied from without; for now it will not take much to convince any person who knows anything of the sanitary history of his country, that, with a pure water supply at our command, we can almost bid defiance to sewage-begotten typhoid. During last August, owing to a fracture in the crank, the water for some time was offensive, but this evil was soon removed. Since then Mr. Whitworth, at my suggestion, has had both the large reservoirs in the Kettering-road, containing respectively two million and one million gallons of water, entirely lined throughout with Portland cement, so that no iron whatever is exposed to the corrosive action of the water, consequently the cause of the chalybeate taste complained of last year has been effectually removed. Fever, however, still lingers in the town, and I am convinced that much of it is to be attributed to the sewer gases which escape from all quarters. I regret to say that my recommendation to the Sanitary Committee to ventilate the sewers by connecting those in the upper parts of the town with lofty shafts has remained unheeded. A proper system of trapping and ventilation is demanded, and every man-hole should be protected so as to render the escape of gases from them impossible. The culvert in the Cow Meadow has not been constructed according to the orders of the Sanitary Authority, and therefore we may daily expect, whenever we do get a sudden fall of about an inch of rain, a repetition of the intolerable nuisance which was the cause of so much just complaint last year. Since writing this, the culvert has given way in five or six places, and bespread the meadow with the unmitigated sewage of Northampton, and all this under the pressure of the insignificant amount of 0·61 inches of rain during Friday evening last. Having now had a somewhat long experience of the working of the Sanitary Act in Northampton, I must confess that I believe nothing of a satisfactory character will be effected until the Urban Authority shall take upon itself the duties which now devolve on the Improvement Commissioners. In fact, the town would be greatly benefitted in many ways if the urban authority were to take upon itself the entire responsibility of carrying out the various sanitary regulations necessary for the preservation of the health of the inhabitants of such an important manufacturing town. Unfortunately for Northampton, the town has extended beyond the south bank of the river, where drainage is almost impracticable; in fact, it may be safely said that Northampton has placed its dead where the living ought to be housed, and the living where the dead ought to be buried. Situated, as Northampton proper is, on an elevated site composed of the characteristic sand, and supplied, as I have observed, by a magnificent supply of water brought from the middle lias at a depth of 165 feet, it might be made one of the most healthy towns in England.

The adjoining village of Kingsthorpe, which has given much trouble to the Rural Sanitary Authority, will in future be governed by urban powers, which have been granted specially to the Rural Authority to meet certain exigencies. This village, with a magnificent supply of pure spring water, is in a most loathsome condition. The water is contaminated by the filthy oozings and drainings from slaughter-houses, wells converted into cesspools, obstructed drains, muck heaps, and surface water.

DAVENTRY lies high, contains the sources of the Nene, and is characterised geologically by the upper, middle, and lower liassic formations. During the decennial period, 1851-60, there were registered an annual average death-rate from fever equalling 114 to every 100,000 living. In the next decade, however, a remarkable improvement took place, the mortality being reduced to 67. The nature of the soil does not admit of so much well-contamination as in many other parts of the county. Many wells and tanks, however, are contaminated by washings from the surface. In the town of Daventry a new system of drainage has been adopted, but as this will form the subject of a special report which I am about to draw up for the Urban Sanitary Authority, I simply now allude to it without comment. In 1873 the death-rate from fever was as low as 21 to every 100,000 living.

WELLINGBOROUGH.—In the rural part of this district there was during last year much fever both at Earl's Barton and Higham Ferrers, and the mortality for the whole area equalled that of Northampton, viz., 49. At Ecton the water supply was much polluted, and it has been decided to sink a deep well near the World's End. This has been commenced, and already more than 120 feet have been accomplished. The geological formation is a capping of great oolite, then Northampton sand, which lies on a thick bed of upper lias. This lias must be penetrated before the water in the marlstone can be reached. At Newton Bromshold, where there is not a single well, and where the inhabitants are totally dependent for their water supply on surface drainage, it is remarkable that very little fever has existed during 1873. It is now proposed to bore in several parts of the parish, in order to ascertain whether a spot can be found where the drift clay with chalk, lying on the Oxford clay, which here caps the cornbrash, is thinnest. At Finedon there was an outbreak of fever last year which was clearly traceable to water pollution. This fever was imported into Islip, in the neighbouring district of Thrapston, from Finedon, but the disease did not spread. Fortunately for Islip, the water in the neighbourhood of this case had its rise free from every possible source of pollution. The subject, a female, had visited a friend at Finedon who had nursed a case of typhoid fever. From Wellingborough also, last November, a servant girl was sent home to Stanwick after nursing her mistress through an attack of typhoid, and the consequence was that she infected the whole of her father's family. This case I have reported to the Thrapston Authority. It was a case of peculiar hardship to the poor man, besides which there was some features in its history which tend to strengthen the opinion that typhoid fever is contagious. During the ten years, 1851-60, the annual average death-rate from fever was 159 ; during 1861-70, 89 ; and in 1873, 49 to every 100,000 living.

Thrapston.—The highlands in this district consist of the great oolite, estuarine clay, and Northampton sand, lying on the upper lias clay, which is laid bare by the tributaries of the Nene. Amongst other places, Raunds, Woodford, and Thrapston have been visited by typhoid fever. In the two first instances, water-pollution and over-crowding were undoubtedly the principal causes ; and in the last, sewer-gas and over-crowding combined. Woodford is about to be well drained, and it is proposed to supply the village with the water that runs from a never-failing spring in a field at the highest point in the village. During 1851-60 Thrapston suffered much from fever, the death-rate being 139 ; during 1861-70 it fell to 77 ; and in 1873 was at the rate of 69 ; which contrasts unfavourably with the neighbouring districts, and especially

Oundle, where the mortality was low, although there was last year a severe outbreak amongst the pupils of the British School, occasioned by the drain from a pigstye bursting into the well which the pupils and the people living in the school-yard used for drinking. Oundle, however, taking it as a whole district, is well situated, and possesses many advantages of soil and climate of which the other riparial districts of the Nene cannot boast. In some parts the oolitic limestone is capped by cornbrash, and rests with its estuarine clay on the Northampton sand and upper lias, which last, however, is not so much exposed as in the districts to the west. During 1851-60 the death-rate was 87 ; during 1861-70, 64 ; and in 1873, 34. This certainly is promising.

In Newport Pagnell the statistics of fever are rather peculiar, inasmuch as in the ten years' period, 1861-70, there was a slight increase of mortality when compared with that of the decennium 1851-60, in which the death-rate from this cause was 66, whilst in the ten succeeding years it amounted to 69. In 1873, however, it fell to less than one-half, viz., 31. Within the area of Newport Pagnell are to be found the great oolite, cornbrash, upper lias clay in the valleys, Oxford clay, and at the Brickhills the upper green sand. At Newport and Olney some very successful drainage works have been carried out. The Sanitary Committee encourage the earth and ash-closet system, and is now embarking upon that most necessary of all sanitary regulations—regular scavenging. This is an example worthy of imitation by every Rural Sanitary Authority in the kingdom ; for after a good and independent water supply, the next thing most needful is the scavenger with his cart. When once this institution has been established, then earth and ash-closets will become practicable, especially if the scavenger be the servant of the Sanitary Authority, or, at least, responsible to it. Not only will the scavenger supervise the closets of the area over which he travels, but he will be a most valuable adjunct to the sanitary staff, and of essential service to the Inspector. Every parish ought to have a "muck acre," where the contents of the scavenger's cart might be emptied, and allowed to remain until it is matured and ripened into manure fit for the farmer's or gardener's use. When once the value of this manure is known, the scavenger's cart will begin to pay. Why the contents of cesspools, &c., have been so frequently condemned by agriculturists is because they have been carted as manure on the land in a crude form, the consequence of which has been that they have poisoned vegetation instead of feeding it. The area of the Newport Pagnell district comprises 70,362 statute acres on which were built, in 1871, 5,687 inhabited houses, occupied by 25,867 persons, of whom 12,680 were males and 5,516 females.

MARKET HARBOROUGH is characterised by the lower lias clay, capped with drift gravel, the middle lias or marlstone, and the upper lias in the western part, where are to be found members of the inferior oolite, viz., the Northampton sand and ironstone, capped here and there with the Great Oolite. The area of this district comprises 64,094 statute acres. In 1871 there were 3,663 inhabited houses, and a population consisting of 7,845 males and 8,236 females, or 16,081 persons in all. The drift gravel which overlies the clay is an everlasting medium for well contamination, a frightful instance of which was evidenced in Saddington, where typhoid fever was entirely due, both last year and this, to the soakage from muck heaps into the town well, or at least into a well that the public used. The amount of chlorides found in this water was very great. Another well has been sunk, and I trust that this beautifully-situated village will in future be immune from a disease that really of late has been of its own creation. Market Harborough town has suffered much from typhoid. Water pollution here again is the cause; in fact, in the lower part of the town, the drainage is far from satisfactory. Here, I believe, as in many other cases, the ash and tub system and the scavengers cart would obviate many of the evils to which both the town and country are subject. Whilst upon the ash-closet system, I wish to refer to a capital contrivance adopted by Sir Henry Dryden, Bart., at his cottages at Canon's Ashby. It consists of a tank on wheels, which when full is easily drawn away to some convenient spot where it is to be emptied. Where a scavenger is not available this is a most convenient plan. The tank is made of sheet iron. By a curious coincidence, the death-rate from typhoid fever was in the two largest districts the lowest, with the exception of Daventry, Newport Pagnell and Market Harborough registering a mortality from this cause of 31 each to every 10,000 living. During 1851-60 the mortality was 69, and during 1861-70 54, which is the same rate as in the adjoining district of Uppingham.

UPPINGHAM is unequally divided by the River Welland, on the north-west side of which the upper lias clay and the Northampton sand predominate, capped here and there with the great oolite. On the south-east side, the Welland is flanked by the lias clay, Northampton sand, capped by the Lincolnshire limestone, which stretches from Maidwell in the Brixworth district into Lincolnshire. At Medbourne there was much fever in 1873, and I believe that the contagious character of typhoid was evidenced by the manner in which this disease was communicated to labourers who worked at Holt in company with persons who lived in Medbourne. Of this I have taken cognizance in my report to the Sanitary Authority of Uppingham. In the neighbourhood of the Northampton sand the wells are exceedingly liable to be polluted. In the neighbourhood of Uppingham is a small sewage farm, which is under the management of the Sanitary Inspector. I hope on a future occasion to report fully on this subject. During the ten years 1851-60 the death-rate from fever in the district amounted to 45, and in the decennial period 1861-70 it increased to 54, and in 1873 it amounted to 57. This is too stationary to be satisfactory. The area of Uppingham is 52,322 statute acres. It contained in 1871 2,673 inhabited houses, and a population of 12,243 persons, of whom 6,209 were males and 6,034 females.

By the annexed table it will be seen that the average mortality in the combined districts amounted in 1851-60 to 105, and in 1861-70 to 71, whilst in the uncombined districts of Brixworth, Kettering, and Peterborough, the rate was respectively, as regards the periods, 116 and 102.

I have made typhoid the subject of my annual report simply because I believe that it is the disease which teaches us best how to be prepared for others. Let us once successfully subdue this great but preventable cause of death, and I feel assured that we shall be able to cope with its allies. Let us strive to get pure water, cart away our undiluted sewage, and institute a system of scavenging throughout our villages, and I believe we shall hear less and less of sewage farms, until the time shall arrive when they will become things of the past, like their progenitors the water closet.

In conclusion, I must again and again urge upon you the necessity of providing for a pure supply of water, the speedy removal of excreta mixed with ashes or earth to the muck acre and a well organised system of scavenging. When this is done I believe that more than half the battle will have been fought, and that our wells will no longer merit the stigma which is applicable to so many now, and conveyed in the following lines:—

> "Hac fonte derivata clades,
> In patriam, populumque fluxit."

I have the honour to be, gentlemen,

Your obedient servant,

Alfred Haviland, Medical Officer of Health to the combined Sanitary Authorities in the counties of Northampton, Leicester, Rutland, and Bucks.

Northampton, 11th July, 1874.

TABLE I.

Average annual proportion of deaths from fever, "typhus of Registrar General" at all ages, in England generally, and in each Registration District within the Northamptonshire Combined Sanitary Area, &c., during the Decennial Period 1851—60, to every 100,000 persons living.

DIVISION OR DISTRICT.		Cause of Death.		
No.	NAME.	Typhoid Fever.		Difference.
		1851—60	1861—70	
	ENGLAND AND WALES.	91	88	*13
III.	SOUTH MIDLAND COUNTIES... ...	—		
10	*Northamptonshire*	—		
164	Brackley	114	109	*5
165	Towcester	100	47	*53
166	Potterspury	111	69	*42
167	Hardingstone	132	77	*55
168	Northampton ... ... H.L.	131	76	*55
169	Daventry	114	67	*47
171	Wellingborough	159	89	*70
173	Thrapston	139	77	*62
174	Oundle	87	64	*23
8	*Buckinghamshire*	—		
153	Newport Pagnell	66	69	‡3
VII.	NORTH MIDLAND COUNTIES... ...	—		
28	*Leicestershire*	—		
409	Market Harborough	69	54	*5
29	*Rutlandshire*	—		
420	Uppingham...	45	54	‡9
		1267	852	
		105·7	71·	
	UNCOMBINED DISTRICTS— *Northamptonshire*			
170	Brixworth	140	112	*28
172	Kettering	112	104	*8
175	Peterborough	98	90	*8
		350	306	
		116·2	102	

*Decrease. ‡Increase.

THE FIRST ANNUAL REPORT OF THE MEDICAL OFFICER OF HEALTH TO THE COMBINED SANITARY AUTHORITIES OF THE COUNTIES OF NORTHAMPTON, LEICESTER, RUTLAND, & BUCKS, FOR THE YEAR 1873.

THE GEOGRAPHICAL DISTRIBUTION OF "TYPHUS" OF REG: GEN: 1851 .1860 IN THE COMBINED SANITARY DISTRICTS OF THE COUNTIES OF NORTHAMPTON, LEICESTER, RUTLAND, & BUCKS,

BY

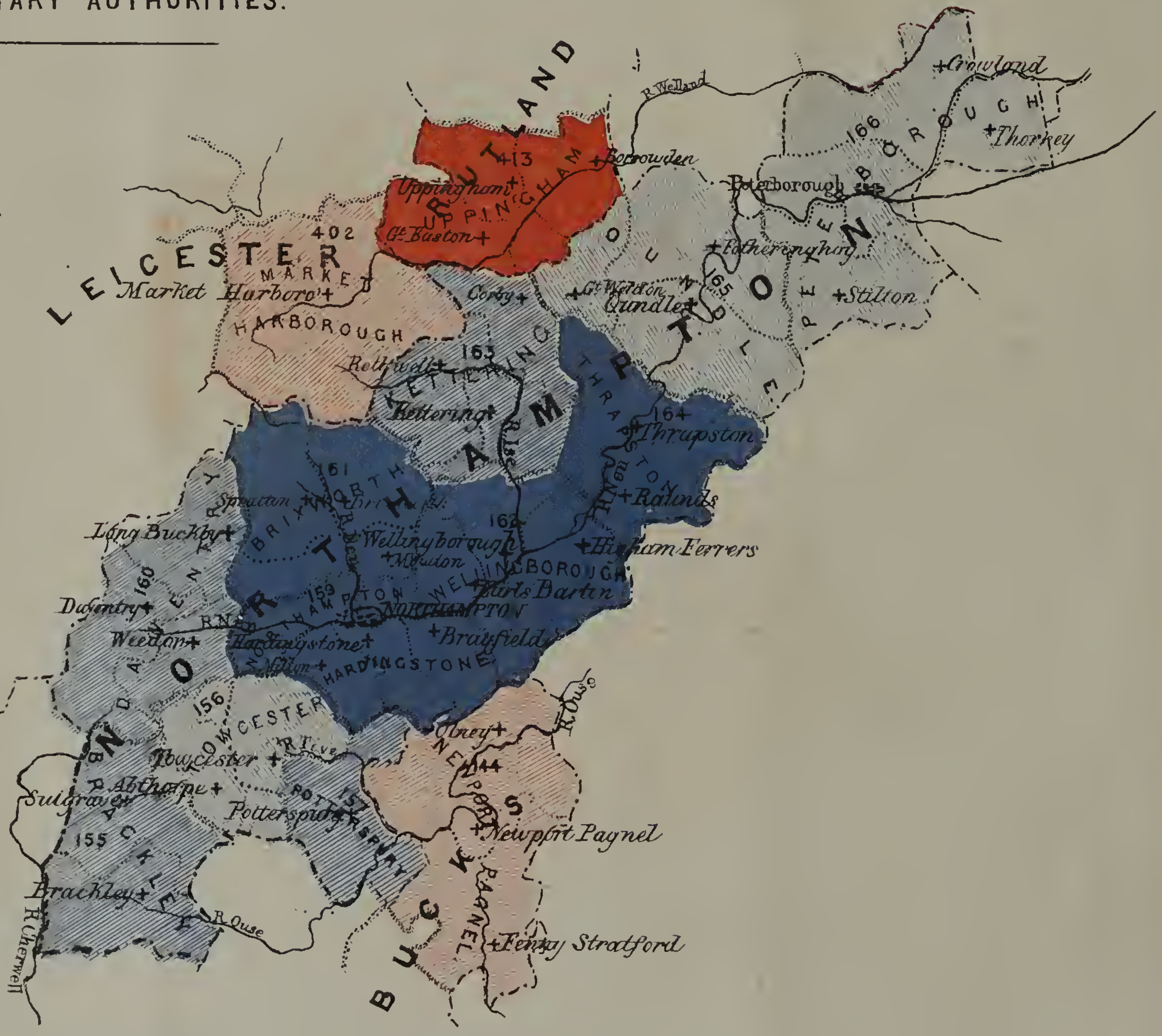
ALFRED HAVILAND, M.R.C.S.E.

MEDICAL OFFICER OF HEALTH TO THE ABOVE COMBINED RURAL & URBAN SANITARY AUTHORITIES.

SCALE OF MORTALITY

EXPLANATION OF THE COLOURING OF THE REGISTRATION DISTRICTS

		DEGREES	310	
MORTALITY ABOVE THE AVERAGE	HIGHEST	6	130–140	ANNUAL AVERAGE MORTALITY FROM "TYPHUS" TO EVERY 100,000 LIVING
		5	110–120	
		4	90–100	
	AVERAGE 88			
MORTALITY BELOW THE AVERAGE		3	70–80	
		2	50–60	
	LOWEST	1	30–40	
			24	



SCALE.

Natural Proportion 1:760,320 or 1 Inch=12 Miles

10 5 0 10 20 30 40 50

W W LAW & SONS LITHO. NORTHAMPTON

THE FIRST ANNUAL REPORT OF THE MEDICAL OFFICER OF HEALTH TO THE COMBINED SANITARY AUTHORITIES OF THE COUNTIES OF NORTHAMPTON, LEICESTER, RUTLAND, & BUCKS, FOR THE YEAR 1873.

THE GEOGRAPHICAL DISTRIBUTION OF "TYPHUS" OF REG: GEN: 1861_1870, IN THE COMBINED SANITARY DISTRICTS OF THE COUNTIES OF NORTHAMPTON, LEICESTER, RUTLAND, & BUCKS,

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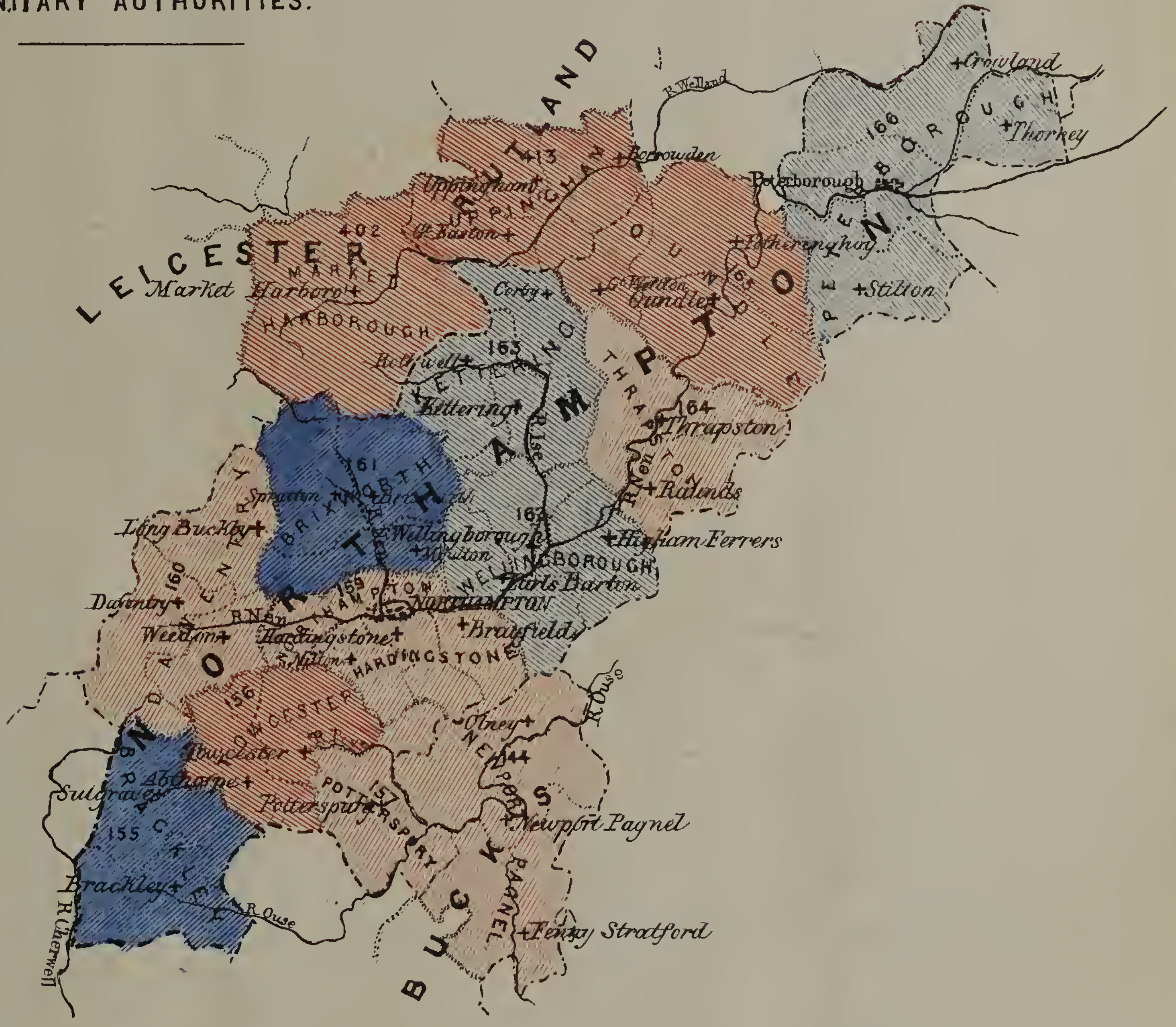
SCALE OF MORTALITY

EXPLANATION OF THE COLOURING OF THE REGISTRATION DISTRICTS

		DEGREES	ANNUAL AVERAGE MORTALITY FROM "TYPHUS" TO EVERY 100,000 LIVING
			310
MORTALITY ABOVE THE AVERAGE	HIGHEST	6	130_140
		5	110_120
		4	90_100
	AVERAGE .. 88		
MORTALITY BELOW THE AVERAGE		3	70_80
		2	50_60
	LOWEST	1	30_40
			24



SCALE

Natural Proportion 1: 760,320 or 1 Inch = 12 Miles

10 5 0 10 20 30 40 50

W. W. LAW & SONS LITHO. NORTHAMPTON.

A SUMMARY

OF THE

Preceding Report on "Typhus" of the Registrar-General.

ILLUSTRATED BY TWO COLOURED MAPS.

The word "Typhus" used to be, at all events for the twenty years 1851—1870, the statistics of which I have illustrated, the generic term used by the Registrar-General, to designate the cases of death attributed to Fever, as an abstract term: and embraced the different species, such as Typhus, Typhoid, &c., in the same manner as the present term "Fever" now comprehends them in the Quarterly Returns of the Registrar's Office. In the Weekly Returns for London there are three columns devoted to Fevers, and headed respectively —Typhus—Enteric (or Typhoid) Fever—and simple continued Fever. This should at least be adopted in the Quarterly Returns.

In rural districts, such as those which constitute my combined area, the disease called Typhoid Fever is infinitely more prevalent than Typhus, and in fact dominates the mortality returns under the head "Typhus," a term that certainly ought not to have been retained so long as it has been. On the other hand "Typhus" is the disease that prevails mostly in towns, where overcrowding is more severely felt than in villages, at least as far as regards this specific form of Fever.

I have appended two maps showing the Geographical distribution of "Typhus" (Fever) in the County of Northampton and the outlying districts belonging to the combined area, thinking that a comparison of the difference in the mortality from this cause during the two decennial periods, 1851—60, and 1861—70, might be interesting to some, and certainly instructive to all Sanitary Authorities, who ought to lose no opportunity of informing themselves of the history of certain preventable causes of death within their respective areas.

I shall just briefly summarise what these two maps teach us with regard to the progress of sanitation within the county of Northampton, as expressed by the figures of the Registrar-General, and grouped under six degrees of mortality, in accordance with the plan I have adopted to illustrate my lectures on the Geography of Diseases, at St. Thomas's Hospital. (See p. 1. of Report.)

I have used the average 88 to every 100,000 living for both decades, instead of 91 for the first period and 88 for the second, which would have been necessary if we had compared the mortality in the combined area with that throughout the county: by adoping, however, a common average, the degrees of mortality in the two maps are made to bear a definite relation to each other.

The river Nene pervades the whole of the Northamptonshire district, either by its main stream or its tributaries, except Brackley and Potterspury, which lie in the catchment basin of the Ouse. The Nene proper rises in the Daventry and Towcester district, and at Northampton is joined by the Northern or Naseby branch, which arises in the Brixworth district; just below Wellingborough the Ise falls into it after having arisen in the Northampton part of the Market Harborough district, and traversed the districts of Kettering and Wellingborough. The main stream wends it way through the districts of Daventry and Northampton, forms the northern boundary of Hardingstone, and bisects Wellingborough, Oundle, Thrapston, and Peterborough; gathering pollution as it goes from the sewage of St. James's End, Cotton End, &c.; the tanneries, breweries, and gas works of Northampton; the fetid effluent water at Earl's Barton from the Ecton farm, where it kills the water weeds and fish; the unmitigated sewage of Wellingborough, through the river Ise; and lastly that of Thrapston and Oundle.

In the first decade, 1851-60, we find that the annual average mortality from Fever in Northamptonshire was 119·9 to every 100,000 living, as compared to 91 throughout England and Wales, showing an excess of mortality of 28·9, or nearly one-third of the average of the succeeding ten years, 1861-70, when the annual average rate had decreased to 88. The difference, however, for Northamptonshire in the Fever death-rate between the two decades was as 119·9 to 81·9 respectively, which was equal to a decreased annual mortality of 38 to every 100,000 living in this county alone; and it is significant that the greatest change took place within the central high mortality group of the sixth degree comprising the districts of Brixworth, Northampton, Hardingstone, Wellingborough and Thrapston, an area characterised by the dominant and easily permeable formation of the lower oolite series overlying the upper lias clay. In this group the highest mortality obtained in Wellingborough (159) and Brixworth (140), whilst the lowest was in Northampton, the town of which I cannot help thinking had even then already begun to emerge from its high death-rate from this cause in consequence of the establishment of its exemplary water works. In the next decade, 1861-70, we find that Northampton had made a leap of two degrees, and although the population of the town had greatly increased, its death-rate from Fever amounted to 76 only, or 12 less than the average for the whole of England and Wales—88. Hardingstone improved at an equal rate. Brixworth only descended one step in the scale, and showed the least improvement in this group, whilst Wellingborough underwent the greatest, the decrease in each district respectively being 28 and 70 to every 100,000 living. Thrapston ranked the next highest, the death-rate having been reduced by 62: so that in this group of five districts alone the average annual rate of mortality fell in the last decade 270 to every 100,000 living.

I will now take the ditsricts which are coloured according to the 5th degree, viz.:—BRACKLEY, DAVENTRY, POTTERSPURY and KETTERING.—Geologically speaking, as I have observed in my report, Brackley and Daventry are not exactly in the same category as those of the last group, inasmuch as in the western part of both districts the middle and lower lias formations have been denuded of the inferior oolite, so that a great portion of these districts are not so liable to well contamination as those in the central part of the county; in fact, I further observed that in Brackley the Fever cases in 1873 were almost exclusively confined to the eastern half where the lower oolite prevailed. Kettering, however, enjoys all the advantages and disadvantages accruing from the free water supply, and permeability of soil which characterises the lower oolite formations. Potterspury, another district of the fifth degree, is overlaid by drift clay, and does not admit readily on this account of well pollution. Brackley will be seen to have retained the place which it held in the first decade, the improvement amounting only to a decrease by five deaths. Daventry, however, made a stride of one degree, its average annual rate of mortality from fever having, during 1861-70, decreased 47 deaths; Potterspury nearly equalled this improvement, the decrease being 42 deaths, whilst Kettering, like Brackley, retained the position it held in the first decade, and only decreased by eight deaths. This chronically high mortality in these two districts demands the most strenuous efforts on the part of the Sanitary Authorities as it indicates an uneradicated cause, or at least one on which their efforts have as yet had little or no effect.

Within the last ten years, 1861-70 there was a saving from the lessened mortality in these four districts of a thousand and two lives to every 100,000 living.

The three other Northamptonshire districts which remain, TOWCESTER, OUNDLE, and PETERBOROUGH, belong to the fourth degree of the death rate scale. In Towcester the annual average mortality was reduced more than one-half from 100 to 47, and I cannot help remarking that this change took place coincidentally with the unwearied assiduity of its excellent sanitary inspector, Mr. Sansom, whose appointment had already extended over many years when the Act of 1872 came into operation. Oundle passed from the fourth degree to the second, and its annual death rate was diminished by 23. Oundle is so situated geologically that within the next five years it ought to rank amongst the freest from Typhoid Fever in the whole county. Peterborough, like Kettering and

Brixworth, does not belong to my area; it showed little sign of improvement during the last decade, the decrease in the number of deaths amounting only to eight. In consequence of the aggregate improvement in these three districts eight hundred and forty lives were saved during the last ten years to every 100,000 living.

The two districts of the third degree, viz., Market Harborough, in Leicestershire, and Newport Pagnell, in Bucks, are neither of them so subject to well contamination as many districts in the county of Northampton. An outline of their geology I have already given in the report. Market Harborough improved one degree, but Newport Pagnell showed a slight retrogression during the last decade.

It will be seen, also, that Uppingham, although most advantageously situated, both geologically and physically, retrograded the last decennial period, one degree. In the period 1851-60 it ranked in the lowest degree of mortality 45, and in 1861-70, it rose to 54. Uppingham and Newport Pagnell, therefore, must be debited with an excess of mortality from Fever during the last decade. As regards Uppingham, there is no reason whatever it should not immediately regain its position. Although it may be difficult for Newport Pagnell to do so, considering the altered social condition of some of the villages in close contiguity to the Potterspury District, which have been invaded by the workmen employed by the London and North-Western Railway at Wolverton, yet, as this company has ample means and opportunities of providing the best sanitary arrangements for those they employ, and of carrying out the directions of the Sanitary Authorities, this large population of well-paid skilled labourers, instead of increasing the death rate from any one cause, ought really to be the means of decreasing it, especially as as regards the cause under discussion.

We have seen that in Northamptonshire the difference in favour of the last decade in the annual average death-rate from Fever amounted to 38 to every 100,000 living; this number in ten years would amount to 380 lives saved; and as the mean population of the county (1861—1871) amounted to 239,656, the absolute number of lives saved would be 1,144 in the ten years, or 114·4 persons a year. Now if we suppose this number to be divided into families of six, with one bread-winner in each, earning ten shillings a week we will say for the sake of avoiding even the appearance of extravagance, this will give us about 190 bread-winners saved to their families, whose annual aggregate earnings would be about £5,000 (£4,940). Had those died as others did in the decade before somebody must have paid for their loss of earnings. The helpless that are left behind must be helped with money—rates. We, however, have only taken into account the *dead*; the diseased and disabled were in far larger numbers. Many a bread-winner lies for months on his back after fever. He first, in too many instances, exhausts his own resources, then he falls on his club, and then the family go for relief—where? To the rates. What I have said refers, however, to only *one* preventable cause of death. I have prepared fifteen other maps, all telling the same tale.

Typhoid has no reason for its existence—the map of its geographical distribution ought to be a blank; but it never will be so until money is judiciously spent generously and freely given, in order to save, not only money, but what cannot be bought, although it is too often sold—human life.

DR. COOPER'S

REPORT

ON

CHOLERA.

SAINT CHRISTOPHER.

28*th February*, 1855.

To His Excellency EDWARD HAY DRUMMOND HAY, *Esquire, Lieutenant Governor of the Leeward Islands, Administering the Government of the Islands of Saint Christopher and Anguilla, Chancellor, Vice-Admiral, and Ordinary of the same, &c., &c., &c.*

SIR,—

Having received instructions from His Excellency Sir WILLIAM COLEBROOKE, Governor-in-Chief of the Windward Islands, to proceed immediately to Saint Christopher, I embarked from Barbados November 27th, on board the Mail Steamer, and arrived in this Island on the morning of November 30th. By the command of your Excellency, I at once assumed the duties of Medical Inspector General for the Island, and I have since that period been engaged in the duties thus devolving upon me.

Cholera had first broken out in the early part of November. The first case publicly announced as a case of Cholera, appears to have been that of WILLIAM ALEXANDER TITTLEY, residing in New Town, and who had arrived three days before by the Steamer "*Conway*" from England; there is, however, no doubt that 5 fatal cases had occurred in the Town of Basseterre, prior to this person being attacked by the disease; the first case on November 1st. This fact at once negatives any supposition that the Epidemic had been introduced from England by the case of WILLIAM ALEXANDER TITTLEY, however disposed any individual might be to believe in so improbable a tale as its having been imported from the other side of the Atlantic by this person.

The strictest Quarantine regulations have been kept up in this Island, since the first outbreak of Cholera in the West Indies in 1850, and the greatest precautions taken, as far as the nature of Quarantine laws permit, to prevent the importation of Cholera, and with as little success against the outbreak of the disease, as at Barbados, Saint Vincent, &c.,—the only other suggestion of any mode by which the Epidemic might have been imported that has been mooted, is the fact of two vessels lying in Quarantine to the windward of the Town of Basseterre, which arrived from Barbados. In answer to such suggestion it is sufficient to state, that no communication can be shown or is likely to have taken place between those vessels and the shore—that no case of Cholera had ever appeared before, or subsequently, on board either of those vessels—and that no case of Cholera had occurred in Bridge-Town Barbados, from whence these vessels came, or in its vicinity, for 3 months prior to this period.

On the other hand, in the autumn of the previous year, Cholera was raging in the neighbouring Island of Nevis, which is only separated from Saint Christopher by a narrow channel of little better than 2 miles, easily traversed by open boats. Notwithstanding the strictest Quarantine regulations at the time, and a more than usually strict watch on account of the proximity of Nevis, frequent communications there cannot be the slightest doubt, were constantly kept up between that Island and Basseterre, by the people of an Estate called the "*Salt Pond's*"—who, in their turn, deriving, as they do, all their supplies from Basseterre, were in the habit of communicating with this Town almost daily. In addition to this, at the heighth of the outbreak in Nevis, a Gentleman and his Wife came over to Basseterre, in defiance of the Quarantine laws, and were actually fined for the offence.

Nevertheless, no Epidemic was imported by these communications with a place in the immediate locality.

That it is possible to keep an Island free from this disease by any Quarantine regulations, is out of the question, and will hardly be asserted after the instances of the Islands of St. Christopher, and Saint Vincent, and Barbados, in all of which, above all others, no expence or trouble was spared to carry the regulations out in the strictest manner possible.

The possibility even of carrying out Quarantine laws in these Islands, so as entirely to prevent any communication from Infected ports, is utterly hopeless, owing to the exposed nature of their Coasts; could it be proved that Cholera could be imported from such places. Those engaged in the task of attempting to enforce Quarantine, freely admit not only the difficulty, but that, in fact, it never is done; and what I have mentioned as taking place with regard to Nevis and Saint Christopher, I know is only an instance of what takes place constantly in other places.

Whilst, on the one hand, the Quarantine laws are useless, both as regard their object, and their capabilities of effecting that object, the positive evil resulting from them is no doubt very great. That an Island, even were it the sole property and kingdom of an independent Sovereign, has a *right* to make any laws by which it shall prevent free intercourse with the world generally, is a doctrine which admits of much argument; but if these laws, in effect, operate to the serious detriment of neighbouring Colonies, few will be inclined to admit such a right. There can exist no right in one place, by which such place can make laws that shall rule others. Such however, is, in a temporary manner, the effect of the various Quarantine laws in the West Indies. For instance, in Demerara, the local law imposes a Quarantine of 40 days—a passenger to Demerara by the English Steamer, and the Steamer itself, would be subject to 40 days Quarantine, should any person be received on board, going from the Island of Saint Christopher by such Steamer, to any intermediate place, say Barbados, until 40 days have expired since the last case of Cholera; so that although the Island to which the traveller desires to proceed requires no such interval to have elapsed, the law in Demerara, in effect, is binding on him, and prevents his progress, because such a law being in force in Demerara, those having charge of the Steamer will not subject it or its passenger, by receiving him on board, to Quarantine upon arrival at their destination. Thus Demerara, in effect, makes a law binding on Saint Christopher and Barbados. The inconvenience and loss arising in this manner, in various ways, is very serious, both to individuals and to commerce generally.

If, upon consideration, it be determined still to adhere to quarantine Laws, at any rate one uniform Law should prevail in the British Colonies, and the shortest possible period fixed upon, to *bear date* from the day of *leaving* any infected port. At the Danish Island of Saint Thomas, 5 days are the number required, and the modern advocates of Quarantine deem this sufficient. The shorter the period, the less is the probability of any attempt to break the Law—it then being scarcely worth while to run the risk of penalties, from any infraction of it. Every place enforcing Quarantine ought also to be compelled to have a proper Lazaretto; many cases of great hardships occur by reason of an omission to have such a place provided. I have myself seen persons returning to their home, refused permission to land, and obliged to proceed wherever the vessel would take them, wholly unprovided with funds to meet such a contingency—this too, may—and does occur often from the whim of the Quarantine Officer, against whose fiat under such circumstances, there is, in consequence of the forced departure from the Island, no appeal. In the case of females and of persons of moderate income, this of itself is a cruel hardship, independent of the delay and annoyance of obtaining an opportunity of returning again from such places as they may be carried to; with persons engaged in Trade, the delay alone may be the source of incalculable injury, even if the vessel conveying the Passenger should remain at the port imposing the Quarantine—the being compelled to remain on board riding at anchor for any period is, under the most favorable circumstances, an annoyance; often, in boisterous weather, a dangerous position, and in some places, as at Demerara, an imprisonment in a most unhealthy locality, at the mouth of a river. Every Island imposing Quarantine for their own supposed benefit, ought, in common justice, at all events to provide a suitable lazaretto.

The circumstances attending the outbreak of Cholera, entirely negativing the idea that it arose from any foreign importation, its appearance at Saint Christopher is enveloped in the same mystery which has hitherto baffled every attempt to explain its eccentric path on the other places.

There are, however, some facts connected with the disease in its attacks on the West Indian Islands, worthy of record—not because they are new in the history of Cholera, but on account of their furnishing us with some little clue to the nature of the Epidemic.

The weather in Saint Christopher had been somewhat remarkable during the years of 1853 and 1854. There had been throughout the year 1853, a very unusual amount of rain, and vegetation had consequently been very rank. In February of 1854, the dry weather set in, and from that time until the end of September, not a drop of rain fell in the Valley of Basseterre, and the heat was unusually oppressive. The weather in the whole Island had been so unseasonable, that the present Sugar Crop is, in consequence, more than two months behind its ordinary period. Experience in the Tropics proves, that such weather is almost invariably the precursor of an outbreak of Fever, especially of Yellow Fever; and of an unhealthy state generally. It was therefore probable that, should an Epidemic appear, it would be of unusual severity, and the state of health was such as to render the inhabitants peculiarly liable to an attack of Cholera. Observation in Europe has incontestibly shown, that in the larger Cities, where Fevers, especially Typhus and Intermittent Fever, periodically occur, at the time when an outbreak of this class of disease might be expected, or has broken out, Cholera has appeared in those places, instead of, or supplanting, the more ordinary Epidemic.'

Although, in some measure, the well known peculiarity of Cholera to attack particular spots or lines of houses has been observed, nothing so remarkable in this respect has taken place in Saint Christopher, as did in the Town of "Port of Spain," at Trinidad, where the houses on the east side of the Streets generally, were the chief seat of the disease, almost to the entire exclusion of the western side of the same street. The houses in the Town of "Port of Spain" are built in regular square, or oblong blocks—the streets, which are wide, running in perfectly straight lines down to the Sea shore, and the cross streets intersecting them in straight lines at right angles.

Thus, the back of the houses on the one side of a Street, are separated from the back of the houses in the next Street, by a wide open space or garden. The wind is constantly blowing from the East, so that the back of the houses on the East side of the Street, owing to the open space intervening between them; and the houses on the West side of the next Street, are exposed to the current of air coming from the East, whilst the proximity of the houses facing on the West-side of the same Street, protect them from the wind. So much is this the case, that the houses on the East side of the Streets are always those the most sought after, on account of their being very considerably cooler, owing to their catching the breeze. Like as in Cholera, so in Yellow Fever, those sleeping on one side of a Hospital, or large room, have been attacked by the Fever, whilst those on the beds on the opposite side of the same room, entirely escaped. The same law apparently prevails in this respect in both diseases. Upon investigating instances of this kind, occurring during an Epidemic of Yellow Fever, I find a very remarkable coincidence with the facts above mentioned, with respect to "the Port of Spain," during Cholera, viz., that the side attacked was always the side exposed to the wind.

Numerous instances are recorded, in which, when the Cholera has broken out amongst the inmates of Public Buildings, the attack of this disease has been more than ordinarily severe; such was the case in the Gaols of Barbados and Trinidad, in both of which, the mortality was very great. On the other hand, isolated instances have occurred, in which quite the reverse has been the case. Thus it was at Saint Vincent, and more marked still in the Gaol of Saint Christopher, where 14 cases occurred amongst the 45 Prisoners confined, and 5 deaths, notwithstanding 15 of the Prisoners (of whom only one died,) were employed during the Epidemic digging the graves at the Crawl, the Cholera burial ground for the Parish of Saint George. I say notwithstanding this, because, owing to the great mortality under similar circumstances at Barbados, some persons were disposed to attribute the deaths to contagion from this peculiar occupation, forgetting that the same individuals had been placed under similar circumstances in the Gaol, with their fellow Prisoners, who had suffered so severely, and it would have been singular if they had not been equally liable to attack.

In connection with this question, it may be right to mention here another very remarkable fact. Persons using Mosquito Netting for their beds, and for blinds, have been known to escape, in a remarkable manner, Epidemics of Yellow Fever—may this not be one of the reasons for the few cases of Cholera, amongst the white Population in the West Indian Islands. With all the foregoing facts before us, not in any way to be accounted for by any notion we have of contagion—nay, directly contradicting any idea of the kind, are we not led to the conclusion, that the Epidemic of Cholera has been introduced into these Islands by atmospheric agency.

The period during which the Cholera has prevailed as an Epidemic disease, in the various localities of each separate Island, has been about eight or nine weeks—the mortality increasing up to the end of the third week, and then gradually declining. Such has also been observed to be the nature of this disease in Europe; where it has been of longer duration, it seems rather to have been the result of two attacks of the Epidemic, than a continuation of the same one, and we consequently find the mortality, after having increased up to the end of the third week, gradually diminishing, although after a time again gradually, but rapidly, increasing for three weeks, when it has, as before, weekly diminished in its usual manner. I do not, of course, include Sporadic cases, which, I apprehend, are attributed essentially to a different cause to that which produces the general Epidemic.

The record of the persons dying daily, from the Epidemic in the Island of Saint Christopher, has been remarkably well kept, and no doubt contains every case—the great accuracy of this is, in a great measure, due to Mr. WATTLEY, the Honorary Secretary to the Board of Health, whose indefatigable zeal and industry during the outbreak of Cholera, in this as all the matters connected with his department, deserves honorable mention. It is the only Island which I have visited, in which it has been possible to accertain, with the slightest approach to accuracy, even the aggregate number of deaths from Cholera. The following is a daily account of the total numbers dying in the several parishes, with the exception of the parish of Saint Peter, Basseterre, where 31 deaths, during the first few days, were included in the deaths occurring in St. George's:—

Deaths

Dr. Cooper's Report on Cholera.

TABLE I.

	St. George, Basseterre.			Saint Peter, Basseterre.	Trinity, Palmetto P'nt.	Old Road.	Saint Thomas, Middle Island.	Saint Ann, Sandy Point.	Saint Paul, Capisterre.	Saint John, Capisterre.	Christ Church, Nichola Town.	Saint Mary, Cayon.	Total.
	Town and Estates.	Hospital.	Salt Ponds.										
November 6	2	...	...	...	...	...	...	...	...	...	...	...	2
7	2	...	...	...	...	...	...	...	...	...	...	...	2
8	3	...	...	...	...	...	...	...	...	...	...	...	3
9	8	...	...	...	...	...	...	...	...	...	...	...	8
10	15	...	...	...	4	...	...	...	...	...	...	...	19
11	12	2	...	...	1	...	...	...	...	...	...	...	15
12	6	6	...	...	2	...	...	...	...	...	...	...	14
13	15	7	...	...	2	...	...	...	...	...	...	...	24
14	21	...	...	...	1	...	...	...	...	...	1	...	23
15	14	12	..	...	4	...	...	...	...	...	1	...	31
16	28	5	...	. .	4	...	1	...	...	...	...	...	38
17	41	8	...	..	3	4	1	1	...	...	..	...	58
18	52	11	...	...	5	4	1	...	...	. .	...	1	74
19	83	23	...	6	1	3	5	1	...	...	...	1	122
20	53	13	...	6	4	17	1	...	...	...	...	...	95
21	76	18	...	10	2	14	1	...	...	...	...	1	122
22	95	15	...	14	3	17	5	6	...	...	...	1	136
23	58	7	...	7	8	26	2	5	...	1	...	1	125
24	64	10	...	11	7	22	5	10	...	1	3	9	148
25	89	9	...	8	10	33	8	7	...	1	5	12	181
26	44	5	...	10	6	23	9	13	...	...	5	9	134
27	74	9	2	9	5	22	6	25	...	3	8	12	175
28	67	9	...	20	5	14	6	19	...	...	2	14	150
29	44	7	1	17	13	14	12	33	...	...	5	11	157
30	48	8	10	15	9	14	10	26	...	1	11	22	174
December 1	26	4	7	7	9	18	10	31	1	...	6	17	136
2	23	6	5	18	4	5	7	30	...	1	8	25	132
3	32	8	2	14	5	7	15	30	3	...	17	20	153
4	25	6	1	17	2	7	5	29	1	4	10	12	119
5	18	5	3	22	2	5	6	23	2	3	10	12	111
6	11	6	1	7	4	8	5	35	...	13	4	15	109
7	5	6	1	15	4	5	8	28	...	12	5	12	101
8	16	3	...	6	2	...	10	26	...	...	6	10	86
9	9	1	...	4	2	1	5	22	1	1	4	13	74
10	7	3	...	3	1	...	7	29	2	2	11	11	80
11	9	3	...	4	3	3	2	16	2	6	5	12	63
12	2	...	...	6	5	...	3	18	1	4	3	9	63
13	3	...	...	3	2	2	3	17	4	16	11	8	58
14	2	1	...	...	1	1	2	12	3	5	9	4	53
15	2	...	...	4	2	2	6	10	1	18	3	8	50
16	5	...	...	5	2	1	2	9	...	12	6	8	44
17	...	21	...	1	1	1	2	6	3	6	3	8	34
18	...	...	...	3	1	...	...	6	3	7	8	4	36
19	1	...	...	3	2	1	1	7	2	6	3	5	32
20	2	...	...	3	...	...	...	3	6	8	3	8	29
21	...	...	...	...	2	...	...	2	4	4	3	5	24
22	...	...	..	...	1	...	1	5	3	8	3	2	18
23	...	...	...	1	1	...	1	5	6	3	1	1	22
24	...	...	...	1	1	...	...	4	6	6	1	2	20
25	...	1	...	...	1	...	...	2	2	5	2	4	18
26	...	...	...	...	1	1	...	3	3	7	4	3	20
27	...	...	...	1	2	...	1	3	2	3	3	7	25
28	...	...	...	...	1	...	...	...	5	5	2	4	21
29	..	. .	...	1	1	...	...	3	4	8	...	2	14
30	...	...	...	...	...	...	...	1	5	3	4	3	16
31	...	...	...	1	...	...	1	...	...	3	2	4	11
January 1	...	...	...	...	...	...	...	...	2	3	1	2	8
2	..	...	...	...	...	...	...	1	5	3	...	3	11
3	...	...	...	1	...	...	1	...	4	2	1	7	14
4	...	...	...	...	...	...	..	...	3	...	...	...	6
5	...	...	...	...	..	...	...	...	2	3	1	1	5
6	...	...	...	...	..	...	...	...	8	1	2	...	12
7	...	...	...	...	...	...	...	1	1	2	2	2	8
8	...	...	...	...	...	...	...	1	...	2	...	1	3
9	...	...	...	...	...	...	...	...	2	1	...	...	2
10	...	...	...	...	...	...	...	...	...	...	1	...	2
11	...	...	...	...	...	...	...	...	1	1	2	...	4
12	...	...	...	...	...	...	...	...	2	1	1	...	3
13	...	...	...	...	...	...	...	...	2	...	...	...	2
14	...	...	...	...	...	...	...	...	...	...	1	...	1
15	...	...	...	...	...	...	...	...	2	...	2	2	6
16	...	...	...	...	...	...	...	...	1	...	...	...	1
17	...	...	...	...	...	...	...	...	...	...	...	1	2
18	...	...	...	...	...	...	...	...	...	1	...	...	...
19	...	...	...	...	...	...	...	...	1	...	...	...	2
20	...	...	...	...	...	...	...	...	...	1	...	...	...
21	...	...	...	...	...	...	...	...	1	...	...	...	1
22	...	...	...	...	...	...	...	..	...	...	...	...	...
23	...	...	...	...	...	...	...	...	1	...	...	...	1
24	...	...	...	...	...	...	...	...	1	...	...	..	1
25	...	...	...	...	...	...	...	...	1	...	...	...	1
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	..	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	1	...	...	...	1

From this account of the total daily number of deaths in each Parish, the following Table is arranged by weeks, dating the first week from the several days on which the first death from Cholera occurred in the respective Parishes, and we find the result to agree precisely, with what has been stated above to have taken place in other localities.

TABLE II.

	WEEK.									Total Deaths
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	
St. George, Basseterre	41	304	582	365	121	29	4	4	...	1450
Salt Ponds	...	...	...	...	...	...	...	...	...	33
St. Peter, Basseterre	31	62	96	85	25	11	3	2	...	315
Palmetto Point	18	26	55	30	16	10	8	1	...	164
Middle Island	15	48	58	38	13	3	2	...	...	177
Old Road..............	85	142	55	7	5	1	...	...	...	295
Sandy Point...........	13	133	206	140	43	22	5	2	...	564
Saint Paul's...........	7	13	19	27	23	14	7	5	1	116
Dieppe Bay............	6	22	62	65	37	22	10	2	1	227
Nichola Town..........	2	21	59	45	43	16	16	5	7	214
Cayon	14	97	106	65	40	23	14	3	3	365
Total	232	868	1298	867	366	151	69	24	12	3920

In the former Table of daily deaths, those dying in Saint Peters during the first period of the Cholera in that Parish, were included with those in Saint George's, but these deaths in the above Table, are inserted in their proper place against the Parish of Saint Peter. It must be observed, however, that several of the deaths occurring at the Cholera Hospital, were those of persons who had been admitted from the adjoining Parishes; and on this account, the total number of deaths in the Parish of Saint George, as given above, are slightly greater than actually was the case.* With regard to "the Salt Ponds," after the disease had existed for ten days, being out of the reach of any Medical assistance, the Inhabitants in a body fled to Basseterre. In the case of the Town of Old Road, the Mortality appears to have been greatest in the second week; but it should be observed, that this is a most unhealthy locality, lying very low, exceedingly damp, and the houses crowded together, to the total exclusion of any thing like ventilation.

The disease, during the first period, is every where invariably more rapid, and more intractable; and the weak, the unhealthy, the drunkard, and the dissolute, are the ones first to succumb to its dreadful blow. Added to this, the people—subject to an entirely new disease—are, in the beginning, less alive to the absolute necessity of the immediate application of remedies, and the warning Diarrhœa, so general a symptom ushering in the disease, does not frequently precede, or rather is almost concometant with the state of Collapse, in the violent attack during the first outbreak of the disease. Diarrhœa also invariably prevails generally amongst the inhabitants of the island—this state of the bowels the people become habituated to, and are thus rendered less disposed to regard seriously such a symptom of disease.

The Cholera Epidemic then, appears to attack a community in a regular manner. Its violence increases, the number of its victims increase rapidly in a given time, apparently by certain fixed rules, and it dies away again also at a fixed period. It attacks those living in what are ordinarily the most healthy localities of a district, as well as those living where all Sanitary precautions against disease are totally disregarded—whilst in many instances the inhabitants of these latter hot beds of ordinary diseases pass exempt. It is true that where it does find its way into these unhealthy localities the inhabitants suffer most severely, yet the occasional freedom of such places, and its fixing on the more open and cleanly places in a district, have led the unthinking to be inclined to consider Sanitary precautions of little or no effect.

I have attempted to state facts which tend to prove it is to atmospheric influences alone that we can turn to account for the introduction of Cholera into a country. If this be *really* the fact is it unreasonable to account for the peculiar nature and progress of the disease where it has been introduced, by the supposition that all persons and places exposed to the action of some passing atmospherical influence are impregnated with the disease at one and the same time; and that the disease lies dormant in the system in different persons a longer or shorter period; such period being regulated by the state of the Health and Physical powers of the persons impregnated. It was well known that such is the case in many diseases and that they are not developed until some days subsequent to the exposure to infection, nor in the same number of days in different persons; for instance where persons are exposed to the influence of small-pox, the disease will lie dormant for periods varying from 8 to 14 days in those exposed at the same time to the infection.

If the Cholera be the result of some atmospherical influence acting at one and the same time upon the whole population, may, if not all, the peculiarities we observe, are at once accounted for. The disease acting more immediately on the unhealthy constitutions, and on those in whom the low powers of vitality are least able to resist, it would necessarily be those in whom the symptoms were more early developed, and who would be most severely affectly, explaining at once how it is that at first the disease is so severe and intractable, and the cause of the large mortality we invariably find the case in the first 3 or 4 weeks of that

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*An instance of carelessness in writing—here it is stated in effect, that the number of deaths was always greater than the number of deaths! What the Reporter means, we presume is, that in consequence of such deaths of persons coming while ill from other Parishes into Basseterre, the rate of mortality in the Parish of St. George appears to have been greater in proportion to the Population, than is actually the case.—*Printer's Devil.*

disease. Its rapid rise and its gradual decline are precisely what would be expected under such circumstances. The inhabitants of low damp, ill-ventilated, and otherwise unhealthy localities, and the idle, dissolute and drunken, would consequently be the first in period of time, as is the case, to suffer from the Epidemic and amongst whom the disease would commit its greatest ravages, whilst although the more healthy, well-ventilated, and cleanly localities might suffer when impregnated, it would not be to the extent nor in severity, in proportion to the others. The directions of the Italians given in accordance with their experience, not to fly to places as yet unattacked by the Epidemic, but to stay where it has broken out or to proceed to places which it has left, is perfectly intelligible upon this supposition. It is thus that we find anything which tends to lower the energy of the vital powers, exposure to cold or wet, drunkenness and excesses of all kinds, producing their consequent depression, are so often followed immediately by an attack of the disease: all such cases have the effect of at once bringing into activity the dormant seeds of the disease.

It is impossible to give any accurate account of the number of persons attacked by Cholera in this island; the materials for forming any opinion are wanting, in as much as before my arrival there were few returns of cases regularly made or kept. Besides this, from the nature of the disease even if these returns were furnished with regularity, which from pressure of cases during severity of the outbreak is seldom the case, they could scarcely be relied on, as no two persons will make a similar classification of the stages of the disease; since the period, however, of my undertaking the duties of Medical Inspector, the returns made to me by the Medical Officers, and House to House Visitors, have been made with considerable regularity; from the returns made, the following were the number of persons and the stages of the disease in each when first seen, together with the deaths occurring amongst these cases.

TABLE III.

	Choleraic Diarrhœa	Cholera	Collapse	Total cases	Deaths.	Percentage of deaths to cases.
St. George, Basseterre	768	737	376	1881	445	23:65 or 5 in 23
Cholera Hospital......	—	—	—	471	256	54:35 or 5 in 9
Other Parishes.........	1388	1637	635	3660	1075	29:91 or 5 in 16
Total Cases Reported	2156	2374	1011	6012	1776	29:54 or 5 in 16

Had the whole of the cases been under Medical treatment, calculating according to this ratio, it would appear that nearly one half of the population had been attacked by the disease. The Missionaries in the Island, especially the Moravian Mission, who are accustomed to afford slight Medical assistance to their flock, in the absence of persons properly qualified, at once exerted themselves in a most laudable manner to assist by giving their personal attendance to the poor. Mr. MUMFORD at Cayon deserves the greatest praise for his unwearied attentions in this way to the sick poor of his locality; as he however has no record of the cases he attended, no result can be given. In the Town of Basseterre, Mr. WAYMOUTH of the Wesleyan Mission, early in the outbreak offered his services, and in a like manner undertook the care of a limited number of cases occurring amongst some of his congregation, selecting such as were not entirely destitute of comforts and the means of aiding him in his efforts. He very judiciously limited the numbers at any one time to some 12 cases, so as to enable him properly to superintend the treatment, rather than by spreading his efforts over a number of cases which it would have been physically impossible to attend to. Proceeding in this manner, his reports of the result of his labors—made from time to time—are, that besides cases of simple diarrhœa, those whom he attended having *some* symptoms of Cholera in a *more or less* aggravated form, were 64 persons, of whom 45 recovered, and 19 died, being a loss of about 5 in 17 cases. I ought not to omit mention here of the incessant exertions of the Ven'ble the Archdeacon, JERMYN, not, it is true, in any attempt to relieve the poor sufferers in the immediate Medical treatment, but in his endeavour to relieve, to his utmost, the necessities and requirements of the poor, in every way. It was in the houses and by the bedside of these, that he was constantly to be found hourly, both day and night. The vast amount of good that he effected in this manner, was incalculable.

The deaths, however, there is little doubt, bear a greater proportion than 5 out of 16 persons suffering from the Epidemic. Very many denied—nay, the general habits of the black and coloured population is a dislike to—regular Medical attendance on them; they prefer to quack themselves with herbs and barks. An unfortunate combination of circumstances at the outset of the Epidemic, by no means tended to increase their confidence in any treatment. It appears that on the meeting of the Board of Health after the first case of Cholera had appeared, the Medical gentlemen then present were requested to draw up a prescription for some general Medicine with directions for use, in order that they might be distributed gratuitously, so that in the unavoidable delay in procuring immediate Medical assistance, which was likely to occur from the great paucity of Medical men, the sufferers might be enabled at least to obtain some suitable general remedy. The result was the recommendation of a Pill containing Calomel, Capsicum, and one grain of Opium, together with a mixture containing Laudanum, Spirits of Camphor, Sulphuric Æther, and Compound Spirits of Ammonia in equal parts. A printed hand-bill was immediately circulated, in which the public were apprised that these Medicines could be obtained upon application from the public supplies. with directions that one of the pills were to be given "immediately, to be followed with three tablespoonfuls of the mixture." The ill effect of this Medicine was soon made manifest. and the directions in the hand bill stated to be a mistake, that it should have been one instead of three tablespoonfuls. The hand bills, however, had been distributed. and no means appear to have been taken to recall them or to issue fresh ones. In the amended directions the dose would be still excessive, if the mixture were not otherwise objectionable. Upon my arrival, I at once prohibited any further distribution.* The ill effect of the medicines prescribed in this manner, tended to deprive the general public of confidence in the regular medical treatment; and unfortunately, just at this moment a person named "SECCHI" arrived in this Island with a quack nostrum. which he designated "Cholera Elixir." The disposition to quackery led the people at once to buy this remedy, and for a few days large quantities appear to have been sold. Its terrible fatal effects soon produced a re-action in the public with respect to this nostrum, and on my arrival in the Island, I found a complete panic,—numerous cases of Cholera had no doubt died without the slightest treatment, and my experience in other places proves that where the disease has been left to its own course, the deaths have been 2 out of every 3 at least of those attacked.

Taking therefore all these circumstances into account, I from my own observation should say that it is probable that about a third of the whole population were attacked by the disease; as regards sex the proportion has been

	Total Deaths.	Population Corrected.	℘ Centage of Deaths to Population.
Males,	1,691	11,179	15. 12.
Fem's,	2,2-9	13,392	16. 44.
Total,	3,920	24,571	15. 78.

so that the disease has been somewhat more fatal amongst the female than the male population, but not to any great extent.

The total mortality from the Epidemic however to the number of inhabitants, is very great as contrasted with European population, altho' not greater than has occurred in many other places. for instance, in Barbados where at least 22,000 died out of a population of 135,000 or about the same proportion. I say at least, for no record by which any positive information can be arrived at was kept, and in this respect, probably Saint Christopher may suffer, when compared with other Islands, in as much as the faithful record of every death, may make the deaths appear large. The proportion of deaths to cases in the Cholera Hospital, (54 35 per cent.) although large, is by no means greater, than is universally the case with Cholera Patients in such institutions all over the world. Thus in 1849 in London, at St. George's Hospital 55, at the Middlesex 50, in Shoreditch Workhouse 56, in Hackney 63, in Saint Luke's 66, and in Saint Giles 83, per cent of the Cholera patients died. The mortality in proportion to the cases reported 23·65. per cent (5 in 23) in Saint Georges Parish and an average of 29·91 per cent. (5 in 16) in the other parishes is by no means an unsatisfactory result when compared with European statistics. In Paris in 1852, of 13,000 persons attacked, 7,000 died, or about 54 per cent, in one department 12,393 cases, and 5958 deaths or 47 per cent. In Saint Petersburgh, the deaths were upwards of 60 per cent. In Berlin in 1848, 65 per cent. In Hamburgh the same year nearly 48 per cent.

The great difference appears to have been not the mortality in a given number of cases, but the greater number of cases to the amount of population, and this perhaps may in a great measure be accounted for. The white population as in the other Islands suffered little or no mortality only five deaths were recorded—when we look to the habits and constitutions of the black and colored population, the low level of the land whereon the chief part of their Houses are located, and the period of the year at which the Epidemic occurred, the severity of the attack may be in a great measure accounted for; the diet of the black and colored population is almost entirely vegetable, with little or no animal food, not even milk, and if any substance other than vegetable does at any time enter into the composition of their meal, it is occasionally fish, and that generally salted. They seldom eat more than one meal (supper) in the 24 hours, and they then distend their stomachs with immense quantities of this bulky description of food. This of itself tends to debilitate the stomach and bowels; they are wholly unable to digest the large amount of food thus suddenly thrust upon them, and nature relieves herself by much of the food passing away undigested, in the form of diarrhœa, hence this, as has been mentioned before, is the natural habit of the bowels of the inhabitants. The description of food is by no means conducive

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~~* Dr. COOPER has, we believe, misconceived, and consequently been led somewhat to misstate, the facts of the case. The prescription as originally written, contained a proper proportion of camphorated water, and the dose was three tablespoonfuls of the mixture, so that there should be one drachm of the more active stimulants contained in the dose. It was however afterwards urged and insisted on, that by substituting camphorated spirits for camphor-water, the medicine would be less bulky and more portable, and that the House-to-House visitors could always dilute it by adding water at the time of administration The prescription was altered, and one teaspoonful of the medicine, in three tablespoonfuls of water, was the dose directed by the Medical Officers. Unfortunately, there was some mistake—(not at all to be wondered at when we consider the alarm that an outbreak of Cholera would naturally occasion in a small Community,) in issuing the directions to the House-to-House visitors. The mistake was discovered immediately, and immediately corrected—corrected long before Dr. COOPER arrived in St. Kitts. With regard to his prohibiting the medicine, he would not have been allowed by the Medical Officers—had he offered to do so,—to interfere in any way with the Medical treatment. Dr. COOPER deserves great credit for the greater efficiency he introduced into the House-to-House visitation; but he did not *actively* assist, in any way that we can learn, in the treatment of cases. On his arrival, he distinctly expressed his concurrence in the plan of treatment he found pursued, and he confined himself pretty much we believe to the collection and arrangement of mere statistics—he did *not* actively assist the Medical Officers in the treatment of any one case, nor can we learn that he conveyed to any one of them any information with regard to the pathology or treatment of the disease, such as might have been expected, and we believe was looked for at his hands.—ED. GAZETTE.~~

to a plethoric state of the system, in the same manner as highly azotized food would be. Owing to the climate, less animal heat is required to be developed by the body, less heat-producing food is necessary, and nature, ever adapting her laws to the necessities of the case, provides abundance of vegetables and fruits in a climate where the inhabitants require this description of food; and in a climate which is so ill adapted to the raising of animal food in any quantity. It is on account of the less plethoric nature of the food, that the black and colored population suffer at all times so little from febrile diseases: it is rarely the case, that any of this class of the population die from fever—nevertheless, when disease does overtake them, the vigor of the system is so slight that they are less able to withstand the shock, or to rally when brought down by any great call upon their physical powers.

To some extent we find that the same alteration, so marked in its character, in the more Northern or Southern latitudes, of a change in the heat producing requirements by the body, in Summer and Winter, is the case in this climate. It is true the variation of the Temperature between Winter and Summer is not so great, still it is to the Inhabitants of these Countries considerable, and we find the same causes produce the same effects as they do elsewhere—in the colder weather the appetite is, sharpened and more food is consumed, to produce the requisite animal heat, which produces comparatively a more plethoric state of the body especially in proportion. as the warmer weather advances. The system being in a condition to generate more animal heat than is required, until the Summer weather has well set in, and the quantity and quality of the food has been adapted to the requirements of the season, until the proper balance is again established, the system is predisposed to disease, and these disease put on an inflamatory type, in consequence of the unnecessary plethoric state When the season again changes from Summer to Winter, the same conditions operate, but in a reverse manner and the system is perhaps more liable to attacks of disease even than in the spring; the system is at this time depressed, from want of vigor, owing to the greater call upon it, in order to supply a constantly increasing demand for the generation of animal heat, and the consequence is an asthenic state, wherein disease has a most depressing effect.

It is well known how great a mortality occurs in attacks of disease amongst the native Inhabitants, in the autumnal season of the year. Dysentary and diseases of the bowels generally, at such a time for instance, are almost always fatal; it is from diseases of the bowels that the black and colored population of these Islands suffer so much, whilst diseases of the Chest and Fever are so fatal to the white population.

It was at such a season (the fall of the year) occurring, when the state of the weather for the last two seasons had been of an unusual character, that the Epidemic, essentially a depressing disease, fell upon the people. Considering the natural want of vigor in the constitution of the native Inhabitants and the season of the year when this otherwise peculiar constitution was further depressed and most obnoxious to disease, it was reasonable to expect that their was little chance of the system being able to throw off the smallest seeds of disease, but that the slightest inpregnation by any Epidemic, and especially of such an Epidemic, would become developed and produce great mortality.

The crowded state of inmates considering the size of the rooms of the houses of the poor classes generally is a great evil, but their universal habit of shutting up their houses carefully, closing at night every crevice by which the smallest particle of air can enter, thus at night breathing the same air over and over again, whereby the proper de-carbonization of the blood during the hours of rest becomes impossible, renders the inmates still more susceptible of disease than even their dirty habits—the material of which the houses or huts themselves are built is also bad, keeping the Inhabitants surrounded as it does by decayed wood when they are old and especially in showery weather, this is very detrimental to their health. The general construction is faulty, ty, and the small space left between the floor and the ground, is also bad; here fowls and animals congregate, and every sort of filth and decomposing organic matter is allowed to accumulate, without chance of removal—the floor of the Houses, if built above the ground, ought at all events to be of sufficient hight to admit of being cleaned beneath. The peculiar character of the land of the Island also, whereon the population reside, is just such as has been found where Cholera attacks the inhabitants in large numbers, it is but slightly elevated above the level of the sea, and in many places almost on a level with it, as is the case with the greater part of the Towns of Basseterre, old Road, and Sandy Point. Three fourths of the inhabitants of the Island live in houses but a few feet obove the level of the sea, built on land sloping very gently, or in a basin, as is more or less the case with a considerable part of Basseterre. Appended to this report, will be found a copy of three letters I have received from Mr. Merritt, Captain of the *Catharine Elizabeth*, Mr. Quin, the Sub-Treasurer, and Mr. Auld, a merchant, all of whom remarked a peculiar mist over the Town of Basseterre, especially the low parts, just at the time the Cholera first made its appearance. Such an unusual phenomenon, at such a time, is. to say the least of it, an exceedingly curious coincidence.

There does not appear to be any locality in the Island which has escaped attack, and of the localities attacked, the following gives the different rates of mortality for each:—

TABLE V.

	Population at outbreak corrected	Total Deaths	Per centage of deaths to Population
St. George, Basseterre	6800	1450	
Salt Ponds	...	33	21·35
St. Peter, Basseterre	2198	315	...
Palmetto Point	1128	164	14·33
Middle Island ...... Old Road	2465	177 295	19·10
Sandy Point............	3730	564	15·10
St. Pauls	1633	116	7·10
Dieppe Bay	2612	227	8·69
Nichola Town.........	1862	214	11·49
Cayon	2110	365	17·29
Total	24538	3920	15·92

The generally more salubrious and healthy parishes of Saint Paul and Saint John, are those in which the rate of mortallty is much the smallest.

In the Town of Basseterre and Parish of Saint George's, the numbers dying in the several localities are

Albert's Village	...37
Bakers' Corner	...51
Beach, the	2
Blake's Estate	1
Bluff Point	1
Buckley's Village	14
Camp Estate	2
Carney's Village	...14
Cayon Street	66
Church Street	6
College Street	...119
College Village	7
Cross Street	2
Cun'gham Hospital	10
Fort Street	11
Frigate Bay Estate	1
Gaol, the	5
Golden R. Village	10
Gut, the	58
Greenland Village	12
Hams Road	1
Hazells Land	4
Hospital, Cholera	256
Irish Town	144
King's Ground...	..80
Carried forward	...914
Brought forward	914
Kitt Stoddarts	32
Liverpool Row	3
LaGueritte Estate	...1
Lozacks Village	3
Nevis Street	30
New Town	272
Pall Mall Square	...5
Pond Village	4
Prickly pear Alley	72
Rawlins' Mornes Est.	1
Rosemerry Lane	...4
Shadwell Village	...11
Sheer Lane	23
Soho	19
Taylor's Village	...24
Temple, the	24
Treasury Alley	1
Victoria Road	6
Watsons' Alley	1
Total from St. George's......	1450
Fr'm St. Peter's Parish	...31
Total buried at the Crawl ...	1481

In the accompanying Plan of the Town the number of deaths are inserted against the several Streets &c. in which they occurred.

By the following table of the rate of mortality of those at the different ages it will be seen that, as is generally the case, the elderly people have suffered much more from the Epidemic than the younger :—

TABLE VI.

	Death per cent to living	or about
Under 5 years	5·99	1 in 17
5 and under 10	6·45	1 in 15
10 and under 15	6·51	1 in 15
15 and under 20	7·25	1 in 14
20 and under 30	7·55	1 in 13
30 and under 40	10·98	1 in 9
40 and under 50	12·65	1 in 8
50 and under 60	13·58	1 in 7
60 and under 70	23·96	1 in 4
70 and under 80	28·34	1 in 3
80 and under 90	22·7	1 in 4
Above 90	37·77	2 in 5

The rate of mortality progressively increased with an increase of age pretty regularly up to the age of 60 when the proporton of deaths to the living became greatly augumented so much so that more than one fourth of the population above that age have been carried off: from birth to 15 years of age about 1 in 15, from 15 years to 60 years 1 in 10, and above 60 years of age 1 in 4 of the population have died. These relative proportions do not differ much from those in European Countries.

Of the seat of Cholera and its treatment, nothing occurred to alter the opinion I have before expressed upon the subject, the total arrest of the whole absorbant system when collapse supervenes must with our present knowledge of medicine render the treatment of this stage of this disease most disheartening. Few who have had the treatment of such cases will be disposed to claim much credit for success. All must deplore their utter inability to combat successfully with any degree of certainty this stage of the disease especially in the black and Colored population when after having apparently even brought them through this stage, they too often rapidly sink from their physical powers, being wholly unable to withstand the shock, and the system to rally. In the earlier stages of the disease, if proper attention be paid, great success will attend the efforts of the attendant.—if once the liver be brought into action a cure may be relied upon. The success I met with in the treatment, I was enabled to carry out in the Island of Saint Vincent during the later period of the outbreak, induced me to recommend the same to be followed in this Island, and when fairly and properly applied, I have invariably heard of its great success.* During the first period of the outbreak as has been stated above, the attacks are always more rapid, and these are often unaccompanied with the premonitory diarrhœa at all events for any length of time—the patient rapidly passing through the various stages, when the mortality is necessarily great—but if the patient, upon the first appearance of diarrhœa, is enabled to procure the necessary remedy, the disease was at once arrested by a dose of Calomel combined with Dovers powder, followed by an aperient of compound extract of Colocynth which is far preferable if to be procured than Castor-oil. The Diarrhœa, if Cholera, cannot be permanently checked by astringents or sedatives, by the administration of which much valuable time, if it be Cholera, is lost. There can be no doubt of this fact, and it is much to be regretted that this line of practice was unfortunately promulgated some years since by authority. Fortunately the treatment of diarrhæa by Calomel and aperients is not only a remedy in the event of its arising from Cholera, but also if it should arise otherwise. The diarrhæa of Cholera itself would appear to be an effort of nature to relieve herself. In the subsequent stages the presence of Colomel in the stomach is an essential ingredient to success.

The rapid nature of the disease renders it necessary that a constant watch be kept for its appearance, and the great utility of a proper system of House to House Visitation, especially where medical assistance was so limited as it is in these Islands, necessarily engaged my early attention; whether the panic produced by the great mortality or some other cause had operated, I do not know, but on my arrival I found the House to House Visitation by no means satisfactory, and it was necessary at once to re-organize the staff for this purpose in the Town of Basseterre; subsequently the duty being efficiently performed by the persons selected, added to the assiduous attention of Dr. Dyett, and Mr. Beard, between whom the medical care of this Town was divided, the confidence of the people was soon established and much good I am convinced resulted from the regularity with which the Visitation was carried on and the consquent prompt administration of the proper remedies.

I also early found the necessity of supplying the House-to-House visitors—the Managers of Estates and others, with medicines and simple rules for their guidance. I consequently drew up prescriptions for some few medicines, to be used in the absence of any Medical attendant, and sent a copy to the several Medical men of the Island, and the dispensers were directed to furnish these medicines to every applicant. Every House-to-House visitor throughout the Island was furnished with the medicines as speedily as possible, and likewise with printed directions,—a copy of which and also of the prescriptions are appended to this report. The directions were distributed also amongst the Managers and Overseers of the several Estates, and the Clergymen and Ministers throughout the Island.

In all this I received the most cordial co-operation from the Board of Health, whose exertions to meet the outbreak I found had been, from the very outset, unceasing, and the arrangements of a most liberal character. Upon the Chairman of the Boord of Health—His Honor the Chief Justice, Mr. Aston Davoren devolved an amount of Labor which few persons would have been physically enabled to accomplish. Prior to my arrival, the chief weight of the arrangements fell upon him alone, and to his activity and exertions, I am satisfied, all owe a heavy debt of gratitude. The assistance afforded to the Chairman by Mr. Quin deserves mention, the order and regularity with which the interments at the "Crawl" took place, was solely owing to the energetic superintendence of this Gentleman, without which, much delay and mischief might have arisen; and to another member, Mr. Udall, are the poor indebted, for the able manner in which he exerted himself in the distribution of food to the necessitous. This most essential branch of the labors of the Board of Health during the Epidemic, was entirely arranged and carried out under the judicious personal superintendence of this Gentleman, involving much labor and trouble.

The Board of Health, as at present constituted, like all such Boards in the West Indies, is composed of too large numbers for practical purposes. The composition seems to have been made rather with a view to obtain the co-operation of some member in the several parishes, than for working purposes. The placing the medical men also upon the Board as members, seems to be a mistake, as it must necessarily interfere greatly with their usefulness; they would have been much more beneficially employed in the attendance on the sick, than by spending 3 or 4 hours at the Board of Health.

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* The Medical Officers of the Districts are ignorant, we fear, of this fact. We have understood that Dr. Cooper, did not afford them any *practical* assistance in the treatment of the Epidemic, and we know that no alteration whatever, in the treatment pursued by the Medical Officers, took place after Dr. Cooper's arrival. He deserves great credit for his decided improvements in the House-to-House visitation, and for his attention to the collection and compilation of statistics ! ! !—Ed. Gazette.

As the Epidemic is now passed, it may not be amiss to consider the constitution of this body, and to put the Board upon a permanent footing. I would strongly urge the necessity of placing at the Head a paid, and therefore a responsible Chairman, who alone should form a quorum, and who, together with a Secretary, might be entrusted with the duties of superintending the general Sanitary regulation, so necessary to be persevered in for the future. The experience of such persons would, in the event of any sudden outbreak of disease, save much of the expense which, from want of any prior experience, necessarily took place during the Cholera. The Board might consist of the paid Chairman, and some three Honorary members, of which, as involving the outlay of money, the Speaker of the House of Assembly, and a member of the Legislative Council, might form two such members of the Board (with the exception of the Sspeaker of the House of Assembly) and the Secretary being appointed by the Lieutenant Governor.

I am given to understand that, in as much as such appointments would not employ the whole time of the persons appointed, a salary of £180 for the Chairman, would command the services of a person of position, and possessing Judgment and experience, and for the Secretary, £150 would be required. When such a Board should be appointed, it would be necessary to pass some well digested sanitary measure for the Island, giving general powers to the Board under ordinary circumstances, and especial powers in cases of Emergency; such latter powers to be called into operation for short periods, as occasion might require, by an order of Lieutenant Governor. The permanent services of a Board of Health so constituted, would be of great benefit at all times, in carrying out Sanitary arrangements, and would be of incalculable advantage to the Colony in any emergency.

Many great evils, especially in the towns and villages, might be remedied by a Building Act, whereby the proper construction of dwellings, and the crowding together of them, might be entirely controlled. without any serious enquiry or interference with the rights of any person. I would suggest an enactment by which, in order to ensure proper ventilation, no buildings should be erected by any one or more than one third of any plot of land he possessed—that no House should be built with any vacancy below it, when the space between the ground and floor of the building was not at least six feet—and that the fence by which it was surrounded did not exceed a certain height—together with other powers necessary for ensuring the proper building, and arrangement of Streets, Gutters, Sewers, or Cesspits. The evils connected with improper buildings and their arrangement, are very great in some parts of the towns and villages. In Basseterre, the parts called Newtown, Irishtown, and Prickley Pear Alley, are especially objectionable, and if a clearance could be effected here by a small outlay, by purchasing up and pulling down some of the houses, it would be extremely desirable. The land might be re-sold to erect proper buildings, subject to the restrictions pointed out, and the money be again available for a like purpose. In this manner, a small fund in the first instance might be made to effect great good. The execution of these powers, granted under a building Act, might be entrusted to the Board of Health.

The question of a good and proper supply of Water to the Inhabitants of Basseterre, I find, has already engaged the attention of the Legislature of the Island, and this good work is now being carried out. This will, hereafter, be a source of revenue; and the control and direction of the business incidental to the Water Works, might likewise be entrusted to the Board of Health contemplated.

Important as the foregoing questions are, a much more serious subject than either of them deserves the most attentive consideration of the Public, viz., the question of Medical attendance, and the present paucity of Medical men. Unless some steps be taken to induce Medical men to settle or remain in the Island, their absence will be most seriously felt. In the time of Slavery, the Owners of Slaves on every Estate paid the Medical men of the District a dollar or a dollar and a half per head per annum for medicines and attendance. Upon the abolition of Slavery, this payment by the Proprietors was given up, and the laborers left to find their own Medical attendant. The result has been, that either from the habit of having had this found them gratuitously, or from a natural dishonesty of character, or from a want of forethought, the black and colored people seldom think of paying a Medical Bill.* The effect of such a state of things is, the gradually diminishing number of resident Medical men, for they find it impossible to obtain sufficient money to meet the most frugal expenditure. The laboring population will pay nothing, and those above that class are not numerous enough to make the practice, in any locality, an inducement to settle or remain, when once the difficulty of procuring the means of subsistence comes upon the Medical man. Hence all suffer, and will do so more than hitherto: both the laborer and the class who can afford to pay for professional services, will be left without any qualified Medical attendant whatsoever, much less a choice, unless some means are provided, other than at present exist. The wisdom of expending large sums in the importation of laborers is not very apparent. whilst those already on the spot are left unprovided with the means of preservation against the attacks and ravages of sickness and disease. The Legislature seems to have felt this evil, for I find that during the past year the sum of £100 each, to five Medical men, has been granted out of the Public funds, for the payment of medical attendance on the children of the poor under nine years of age. The result of even so small a bounty had the effect of inducing two medical gentlemen to settle in the Island, and thus made an addition to the general medical staff: some dissatisfaction, it is true, whether just or not, has been expressed as to the attendance under this Bill; but the fault is not so much in the principle of the measure, as it is in the want of some person or body to ensure, by proper constant superintendence, the efficient working of the law. The amount granted for the attendance on the children, it is very evident will not retain in the Island the services of gentlemen for any period, nor can it be expected that an amount sufficient to secure this object, can be granted out of the Island Treasury. I would therefore suggest a mode of payment to medical men for their attendance upon the laboring population, which would at once furnish a sufficient amount of money to command the settlement in the several districts of the Island, of properly qualified medical men, and ensure the best available means of preserving the lives of those who labor on the soil, and without whom the land itself is worth little; at the same time, it would secure to those in more affluent circumstances, the presence in their locality of medical men, whose services they might be able to avail themselves of in case of sickness overtaking themselves or their families.

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* If the Reporter had had a little personal experience of Medical practice in the West Indies, he would have found that this forgetfulness of the Medical attendant is not confined to any particular class of the Community; but is, with very occasional exceptions, generally *endemic.*—Ed. Gaz.

All attempts at voluntary medical clubs hitherto have been more or less a failure; and I would therefore make them compulsory by Legislative enactment, by rendering it imperative on the employer of weekly or daily labor, to deduct at the rate of one penny per week from the wages, and to pay such sum into a general medical fund. This would in no one year exceed a dollar deducted from the laborers wages for his medical attendance, and in the aggregate would create a considerable amount. This is the system adopted by the proprietors of mines, factories, &c., in England, to provide for the medical attendance on those in their employ; as labor, however, is there abundant, they are enabled to insist upon an agreement to a deduction for this purpose, as a condition of employment; but it would be necessary, in this Island, where labor is and must always be more or less scarce, as also owing to the nature of the circumstances, to make such a deduction one of legal enforcement. I am disposed to think, from enquiries I have made, that such a system would not be objected to either by master or servant, and any small objection in individual cases would die away, when the benefits derived are discovered upon the system being brought into operation. It avoids the evils of being a charitable donation, and altho' it would be a compulsory payment, nevertheless the laborer would feel that his medical attendance was a right purchased by his own money. The payment should be certified by the employer, and thereupon the right accrue to seek the advice of any medical gentleman he might desire, although in case of attendance at his own home, it would be necessary to restrict him to the one appointed to the district in which the patient resided. By the Census, it appears that there are 7,500 laborers, and 1,200 domestics, who would contribute to such a fund, in round numbers, probably about 8,000 persons, which would thus give about $8,000, or £1,666 yearly, as the sum collected. I should suggest the re-arrangement of the present Medical Districts into six instead of five, creating a new one for Nichola Town, and extending the Dieppe Bay District more in the direction of St. Paul's, and the Cayon one more towards Basseterre. The Medical Fund should be equally divided between the Districts, and would then give, added to the £500 public money granted for attendance upon the children under 9 years of age, about £350 for each of the Districts. This, together with any sum which might accrue from attendance on other persons in the locality, would be such as to ensure the settlement in the Island, of competent and well-qualified parties.

The arrangement and superintendence of all this should be with the Board of Health, and to them should be made weekly returns of the attendance, more especially the attendance upon the children. Any complaints against the medical attendant would be made to the Board of Health, and I would suggest that power of suspension in cases of proved neglect or irregularity, should be placed in the hands of the Board who should thereupon make a written report to the Lieutenant Governor, in whom alone should rest the power of dismissal. These powers would be similar to those possessed in England by Boards of Guardians, who have the power of suspending their Officers, but the dismissal rests with the Poor law Board. No doubt great benefit would result if, in the general superintendence, in respect to this as well as Sanitary matters generally, the Board and the Lieutenant Governor were enabled to avail themselves of the services of some independent medical man; but unless a permanent General Medical Inspector for the West Indian Islands be appointed, such would be impossible. The advantages to be derived from this scheme of medical attendance, by, as it were, a compulsory medical club, would be much aided by a supply of medical necessaries during illness; and, it might not be objected to, that under these circumstances, the general public should so far aid the subscribers to this fund, by contributing such comforts and food as might be required, upon the written order of the medical man, during his attendance, only, subject to proper rules and regulations; should this be acquiesced in, some proper person could be appointed by the Guardians of the Poor in each of the several parishes, to receive and execute the orders given.

A proper registration of Births and Deaths, with the cause of death, certified by the medical men would under the system of attendance suggested, be easily effected. The Chairman of the Board of Health might be appointed

Register General, and Quarterly returns made to him.

It has been suggested to me, that the services of the Chairman of the Board of Health might be also rendered available, in auditing the Public Accounts, before they are presented to the Committee of Public Accounts.

Such is a hasty, and necessarily a slight sketch, of requirements, which seem to me to demand immediate and serious attention. The details would be easily arranged. if the principle be conceded in any or all of the measures pointed out, and I feel confident the inhabitants of the Island, as a body, would all feel the benefit which would result from the very small outlay of public funds which is involved in these suggestions.

In conclusion I have only to add, that finding the duties that had engaged my time so fully during the pressure of Cholera had somewhat abated, and the suggestion of obtaining a Census having resulted in the issuing of a Commission by your Excellency for this object, I have more recently been enabled to devote my attention to arranging and drawing up Tables from the returns. A copy of the result of these labors was appended to the Report of myself and Brother Commissioners, which has already been forwarded to your Excellency.

I have the honor to be, Sir,
Your obedt. Servt.,
THOs. H. COOPER.

COPY OF LETTERS REFERRED TO.

On Board the Catharine Elizabeth,
St. Kitts, Feb'y 26th, 1855.

Sir,—In answer to your enquiries as to the peculiarity in the atmosphere, which I observed from my Ship in the bay, at the beginning of November last, I have to state, that it took place some 4 or 5 days before the commencement of Cholera in Basseterre, but I cannot charge my memory with the precise day; it had the appearance of a thin bluish transparent haze over the Town, and although I had been riding at anchor, awaiting a cargo, since August last, I had never observed anything of the kind before, nor have I since that period. At the time, I remember, it was quite a dead calm, scarcely any wind at all.

Your Obedient Servrnt,
Peter Merrett.
Captain.
Edward Henare.
Chief Officer.

To T. H. Cooper, Esq., Medical Inspector.

Basseterre, St. Kitts, 28th Feb., 1855.

My dear Sir,—With reference to our conversation, and my remarks on the strange appearance of the weather in the early part of November last past, I must regret being unable to furnish you with precise information on the subject. I recollect it to have been about the first days of the outbreak of the Cholera, but I cannot speak positively as to dates, when I observed that the Town, more particularly that portion known as New Town, when viewed from the high land at the opposite western extremity of Basseterre, appeared to be covered with a light thin haze. I have before observed, at a very early hour in the morning, a mist approaching it in appearance, but which quickly disappeared with the rising sun; but in the present instance it was not so, but the vapor continued to hang over the Town during the whole day. The weather at the time was very calm, the light air that did exist being from the usual quarter, East. I regret not having made more particular observation at the time—and beg to remain

My dear Sir,
Yours truly
Wm. Quin.

T. H. Cooper, Esq., Medical Inspector.

Basseterre, 28th Feb., 1855.

My dear Sir,—Having passed the day with a friend resident in a somewhat elevated part of the Island, I had an opportunity of observing, to advantage, the peculiar appearance of the atmosphere, to which you refer as having been noticed by others, on the Thursday immediately preceding the outbreak of Cholera.

A thick palpable light grey cloud, similar to a *fog bank*, hung over the margin of the land, apparently motionless, altho' the usual fresh breeze was blowing, and all around the sky was comparatively clear; early in the morning a similar appearance might not have attracted observation, but this was at bright noon day; nor at the moment did I attach more importance to it, than I would have done to any of the peculiar atmospheric appearances occasionally presenting themselves to the eye; but since the outbreak of Cholera, two days after, I have—whether rationally or not—always associated it with the Epidemic.

I am, yours very truly,
R. C. Auld.

T. H. Cooper, Esq., Medical Inspector.

A Statistical Digest
of the
Mortality arising from Enteric Fever & its [illegible]
within the
Borough of Halifax

dating from the Extension of the Municipal Boundary
in the year
1865 up to 31st December 1875.
carefully compiled from official records, giving the area,
the number of Dwellings annually assessed for the
relief of the poor, Gross rental & births & deaths
together with the Estimated amount of population
& the density of the population of each Ward.

by

J. R. Smith

Late Sanitary Inspector for the Borough

1874.

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Preface.

Though the facts contained in these pages were originally collected for a special purpose, they are now introduced in a permanent form for limited circulation, believing in the absence of any similar record, that they may be made useful & valuable not only as a means of forwarding the movement now in force, going on throughout the country in the direction of Sanitary Reform, but as affording general information when treating upon the vital interests of the Borough. — They are also placed in the present form, without any attempt to comment upon any particular system of "Sanitary Management" with a desire to put the reader in possession of practical facts rather than to obtrude upon his notice any pet scheme or project.

In explanation it is necessary to note, that the numerous items are taken from 1st January to 31st December in each year dating from the year 1865 (coincident with the extension of the Parliamentary boundary), and that the Borough of Halifax forms only a part of the "Sub-district" named in the Reports of the Registrar General, including not a fourth of the entire area, for the and "sub-districts", include the whole of the Parishes of Aberdeen, [illegible], [illegible] & "[illegible] with [illegible]", the two latter being [illegible] united for the purposes of registration. Previous to 1874 the [illegible] [illegible] (in their register, compiled from the [illegible] returns separately supplied to them by the several [illegible]) [illegible] [illegible] in separate Tables for the whole Borough, [illegible], however, a better [illegible] was [illegible] in operation, whereby they are now particularly [illegible] in all Wards.

The [illegible] have been made with a view to the health & [illegible] of the [illegible] [illegible] [illegible] of the "[illegible] [illegible]" and [illegible] a [illegible] [illegible] of [illegible] [illegible], [illegible] also the [illegible] [illegible] & [illegible] [illegible] of [illegible] [illegible] [illegible] [illegible] a [illegible] miles.—

The [illegible] have been arranged in a series of [illegible] [illegible], & may be [illegible] described, as follows:

1st The Total Occurrences, describe the several items of information in each Ward separately.

2nd The Particular Occurrences are made out [illegible] & for [illegible] [illegible] arrange the [illegible] of each Ward.

3rd The Ward Summary of Wards, one with averages for the whole period under investigation and one of their relative importance.—

4th The Grand Summary, that of the Borough as a whole and delineates the annual state of affairs.—

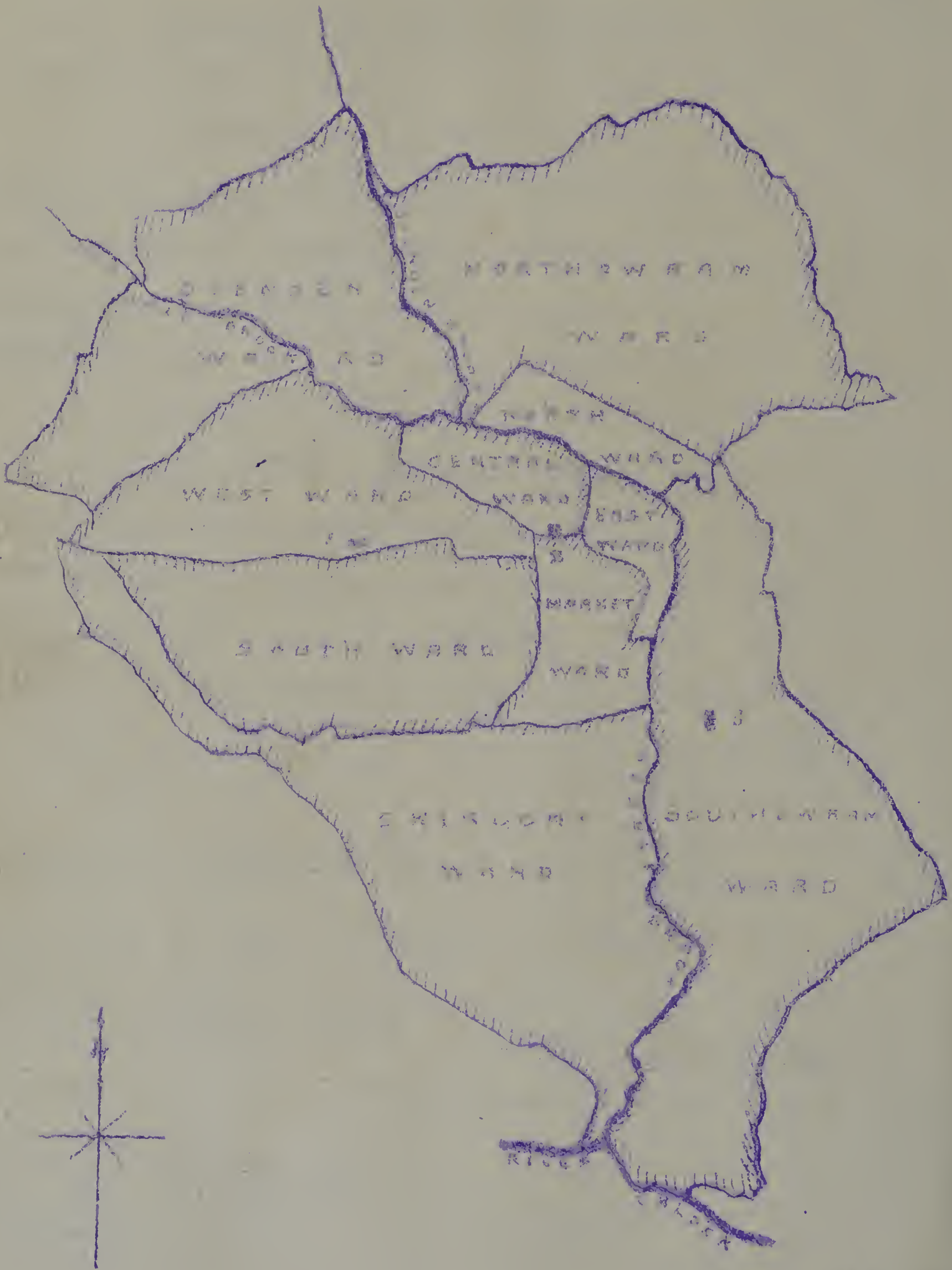
5th Summaries of Fever Mortality in the [illegible] Public Institutions, situated in the Borough viz; The Union Workhouse in East Ward & the Borough Hospital in Southowram Ward.—

6th A Summary of the Total number of Fever Cases admitted into the Borough Hospital since its establishment in the year 1872, setting forth the numbers sent into the institution from each Ward, annually, as well as those from Townships out of the Borough.—

7th A Diagram illustrating the fluctuation of the general death-rate & the gradual development of the "Goux System" within the Borough.—

4 [illegible] and Halifax
1876.

Map of the Borough of Halifax
divided into Wards.

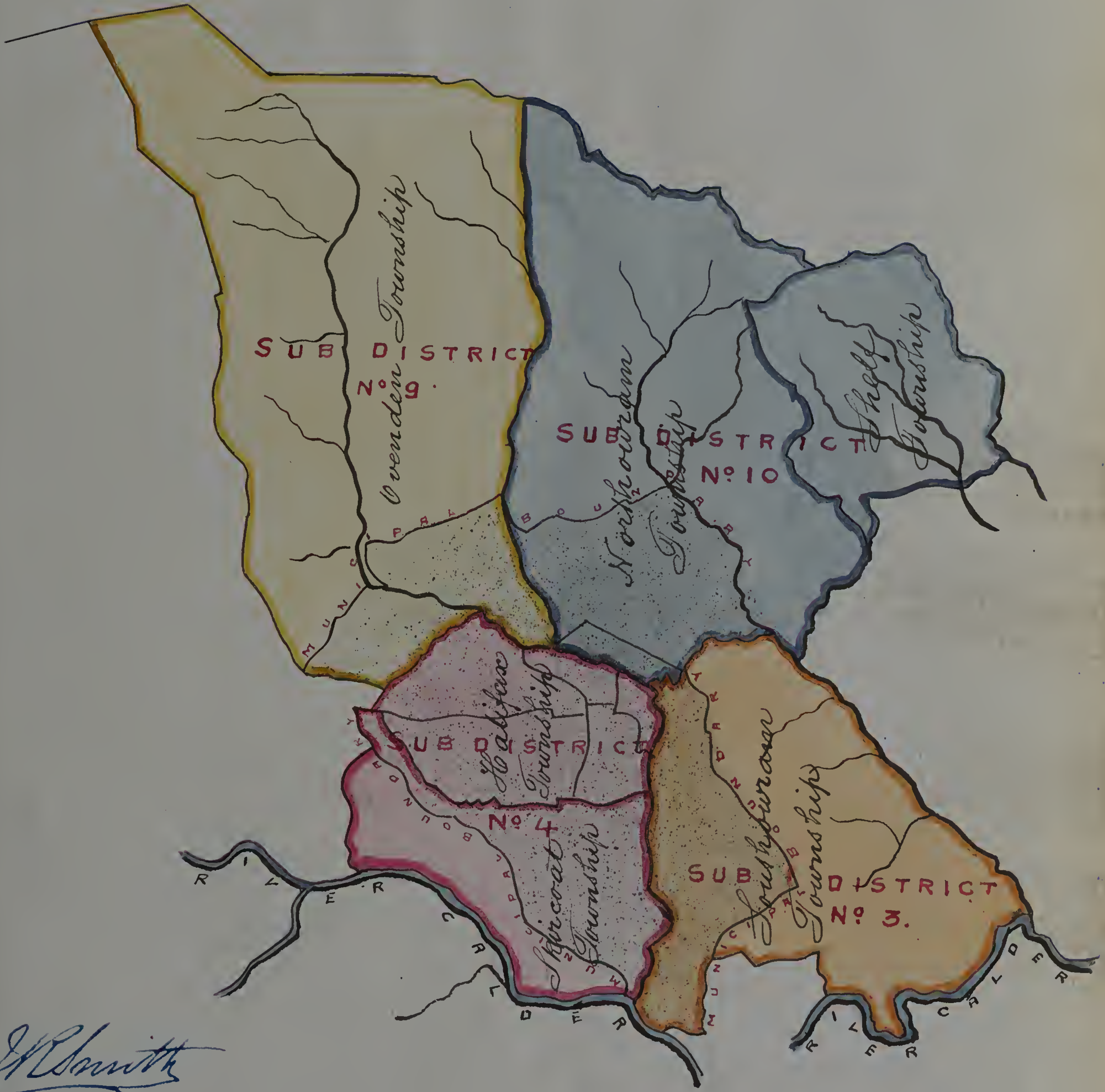


A. Smith.
August 1876.

1. Union Workhouse
2. Town Hall
3. Borough Hospit

Scale 2 Inches = 1 Mile

Map of Registration Sub-Districts showing the Extent of the Borough of Halifax *



J H Smith

Scale 1 Inch = One Mile

* Vide the Reports of the Registrar General (page 53) No 495 Halifax

Bureau of [illegible].

Summary, [illegible] Road [illegible]

Year	Mileage		[illegible]				[illegible]			Deaths							[illegible]		
1865	838	–	–	–	157	[illegible]	53	–	[illegible]	–	–	2	–	1	2	–	[illegible]	.28	–
6	[illegible]	5	–	–	147	[illegible]	[illegible]	–	[illegible]	5	[illegible]	–	–	–	3	–	20.1	[illegible]	–
7	878	33	–	–	157	[illegible]	38	–	4037	–	–	1	–	–	–	–	[illegible]	.24	–
8	882	4	–	–	146	[illegible]	[illegible]	–	[illegible]	2	–	2	–	–	–	–	21.3	.71	–
9	904	22	–	–	138	100	55	–	4179	–	1	–	–	–	–	–	20.7	.23	–
70	965	61	–	–	185	120	45	–	4225	2	–	2	–	–	–	–	23.2	.74	–
1	999	34	31	31	171	95	73	–	[illegible]	2	–	–	1	–	–	–	22.6	.16	7.2
2	1098	94	90	121	197	140	57	–	4304	5	–	[illegible]	–	–	2	–	22.4	[illegible]	27.8
3	1128	35	55	174	189	103	56	–	4431	–	–	5	–	–	–	–	23.3	1.12	39.3
4	1160	32	49	223	222	124	94	–	4528	–	–	2	–	–	–	–	22.2	.44	46.2
1875	1201	41	23	246	206	98	103	–	4633	–	–	–	1	1	–	–	[illegible]	.43	53.0
[illegible] for the [illegible] Years	–	363	246	–	[illegible]	[illegible]	[illegible]	–		[illegible]	2	16	2	2	[illegible]	–	Average [illegible]	[illegible]	

Borough of Halifax

Summary Northowram Ward Area 3,390,178 Sup^l Yards

Year	Dwellings		[illegible]		[illegible] Births Registered Annually	Total No. of Deaths from all causes Register'd Annually	Excess		[illegible] Population	Deaths — Fevers —							Annual Death rate per 1,000 persons		[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]			Births	Deaths		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
1865	1013	—	—	—	169	113	56	—	6176	—	—	1	—	1	1	—	18.2	.48	—
6	1112	99	—	—	194	104	90	—	6266	—	3	2	—	—	1	—	16.5	.95	—
7	1149	37	—	—	184	86	98	—	6364	1	—	1	—	1	1	—	13.5	.62	—
8	1242	93	—	—	238	123	115	—	6479	1	1	1	—	1	—	—	18.9	.61	—
9	1324	82	—	—	227	119	108	—	6585	—	—	2	—	1	—	—	18.0	.46	—
1870	1340	16	—	—	224	161	63	—	6650	2	1	4	—	—	—	—	24.2	1.05	—
1	1343	3	53	53	266	118	148	—	6798	1	—	1	—	1	4	—	17.3	1.02	12.
2	1343	—	52	105	270	118	152	—	6950	1	—	4	—	—	1	—	16.9	1.15	14.3
3	1355	12	12	117	262	121	141	—	7071	—	—	2	—	—	—	—	17.0	.28	16.
4	1357	2	17	134	278	160	118	—	7098	—	—	6	—	—	1	—	22.5	.97	18.6
1875	1402	45	51	185	322	164	158	—	7333	—	—	8	—	—	1	—	22.3	1.22	25.
Total for the whole Period	—	389	185	—	2634	1387	1247	—		6	5	34	—	5	10	—	Average 18.8	.81	

Borough of Halifax

Summary North Ward.. Area 442,255 Supl. Yards.

Year.	Dwellings		Earth Closets		Number of Births Registered Annually	Total No. of Deaths from all Causes Regist. & Coroners'	Excess		Annually Estimated Population	Deaths							Annual Death rate per 1,000		Annual rate of Earth Closets per 1,000 persons
	No. upon the Rate Books annually assessed to the Poor	Annual increase or decrease	Number Registered Annually	Total [illegible]			Births	Deaths		Fevers							From all Causes	From Fevers	
										Variola	Scarlatina	Enteric or Typhoid	[illegible]	[illegible]	Diphtheria	Erysipelas			
1865	1089	—	—	—	266	169	97	—	5346	1	—	2	1	3	—	—	31.6	1.33	—
6	1118	29	—	—	231	153	78	—	5424	—	1	6	1	—	—	—	28.2	1.47	—
7	1129	11	—	—	264	144	120	—	5544	—	—	2	1	—	—	—	25.9	.54	—
8	1155	26	—	—	235	159	79	—	5623	1	—	3	1	—	2	—	28.2	1.24	—
9	1169	14	—	—	262	188	74	—	5697	—	1	2	—	—	2	—	33.0	.87	—
1870	1171	2	9	9	263	207	56	—	5753	—	2	3	—	—	—	—	35.9	.86	1.5
1	1179	8	78	87	239	182	57	—	5810	1	—	6	—	1	—	—	31.3	1.37	14.9
2	1185	6	46	133	233	163	70	—	5880	—	—	4	—	—	—	—	27.7	.68	22.6
3	1185	—	28	161	238	155	83	—	5963	1	—	4	—	—	—	—	26.0	.83	27.0
4	1187	2	24	185	245	177	68	—	6031	1	—	1	—	—	—	—	29.3	.33	30.6
1875	1206	19	17	202	270	172	98	—	6129	—	—	2	—	—	—	—	28.0	1.15	32.9
Total for the 11 Years	—	117	202	—	2749	1869	880	—		5	4	42	4	4	4	—	Average 29.9	.99	

Borough of Halifax

Summary, Central Ward   Area 403,495 Supl. Yards

Year.	Dwellings: Number in the Rate Books annually after first of May	Dwellings: Annual Increase of Dwellings	Water Closets: Increase annually	Water Closets: Total No. within the Borough annually	Number of Births Registered Annually	Total No. of Deaths from all Causes Registered Annually	Excess: Births	Excess: Deaths	Annually Estimated Population	Deaths — Fevers: Simple	Deaths — Fevers: Continued	Deaths — Fevers: Enteric or Typhoid	Deaths — Fevers: [illegible]	Deaths — Fevers: Gastric	Deaths — Fevers: Typhus	Deaths — Fevers: [illegible]	Annual Death rate per 1,000 population: From all Causes	Annual Death rate per 1,000 population: From Fevers	[illegible]
1865	1526	—	—	—	256	186	70	—	8254	1	—	1	—	—	1	—	22.5	.36	—
6	1601	75	—	—	267	184	83	—	8337	1	1	3	—	1	4	—	22.0	1.19	—
7	1655	54	—	—	245	175	70	—	8407	—	—	1	—	1	—	—	20.8	.23	—
8	1699	44	—	—	302	234	68	—	8475	3	2	4	—	1	—	—	27.6	1.17	—
9	1808	109	—	—	267	172	95	—	8570	—	—	3	—	1	2	—	20.5	.69	—
1870	1960	152	19	19	300	268	32	—	8602	1	1	3	—	—	2	1	31.1	.93	2.2
1	1974	14	111	130	310	211	99	—	8701	—	—	7	—	—	1	1	24.2	1.03	14.
2	1984	10	84	214	308	227	81	—	8782	—	—	17	—	1	—	—	25.8	2.04	20.
3	2001	17	34	248	319	177	142	—	8924	—	—	7	1	—	—	—	19.8	.89	27.
4	2010	9	52	300	337	223	114	—	9038	—	—	6	—	—	—	—	24.6	.66	33.
1875	2053	43	64	364	300	216	84	—	9122	1	2	5	—	—	—	—	23.6	.87	39.
Total for whole Period	—	527	364	—	3211	2273	938	—		7	6	57	1	5	10	2	Averages 23.8	.93	

Borough of Halifax

Summary West Ward. Area 1,079.201¼ [illegible]

Years	Dwellings		[illegible] Closets		[illegible]	[illegible]	[illegible]		[illegible]	Deaths — Fevers							[illegible]		[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1865	1501	—	—	—	232	268	—	34	11117	7	1	5	1	1	4	—	24.1	1.73	—
6	1524	22	—	—	271	272	—	1	11116	2	—	3	—	1	4	—	20.4	.89	—
7	1575	91	—	—	310	245	62	—	11178	2	—	1	—	—	—	—	22.1	.26	—
8	1764	89	—	—	313	249	14	—	11192	2	1	3	—	1	—	—	25.7	.62	—
9	1814	50	—	—	348	298	50	—	11242	2	—	4	—	—	7	—	25.5	1.05	—
1870	2130	316	42	42	402	428	—	26	11216	5	1	8	—	—	7	—	32.1	1.87	27
1	2319	189	204	246	464	323	91	—	11307	2	—	4	—	1	2	—	28.5	.79	2.7
2	2525	206	120	366	413	350	63	—	11370	1	—	9	—	—	—	—	30.7	.87	32.1
3	2593	64	113	379	398	343	55	—	11425	1	1	6	—	—	—	—	30.1	.70	42.5
4	2695	102	71	550	421	419	2	—	11427	—	—	4	—	1	—	—	26.5	.43	50.7
1875	2795	100	30	644	468	379	89	—	11516	2	3	5	1	—	1	—	32.9	1.04	59.3
Total for whole W.	—	1294	644	—	3996	3627	463	61		21	7	52	2	5	24	—	[illegible] 30.2	[illegible]	

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Borough of Halifax

Summary. South Ward. Area [illegible]

Year	[illegible]		[illegible]							[illegible]							[illegible]		
1865	1268	—	—	—	171	173	8	—	7049	2	—	1	1	—	3	—	22.5	.99	—
6	1316	27	—	—	149	133	39	—	7085	1	1	—	—	—	2	—	14.3	.66	—
7	1348	35	—	—	196	155	11	—	7094	1	—	2	—	—	1	—	26.0	.56	—
8	1397	39	—	—	169	146	43	—	7142	2	—	1	—	—	2	—	21.8	.70	—
9	1427	106	—	—	147	200	—	3	7139	2	—	—	—	1	1	—	28.0	.56	—
1870	1594	107	27	27	220	231	9	—	7145	1	—	10	—	1	2	—	23.3	1.96	67
1	1642	45	127	154	233	179	34	—	7202	—	—	6	—	—	—	—	24.8	.60	21.3
2	1729	67	133	267	237	197	40	—	7242	2	—	12	—	—	2	—	27.1	2.23	22.3
3	1834	125	121	225	262	212	70	—	7312	—	1	6	—	—	—	—	28.9	.95	55.5
4	1912	55	104	336	279	[illegible]	23	—	7340	3	—	1	—	—	1	1	34.1	.77	73.0
1875	2142	242	[illegible]	422	293	186	99	—	7438	—	—	5	—	—	—	—	29.2	.13	76.5
Totals for 11 Years	—	856	842	—	2303	2104	377	3		14	2	40	1	2	14	1	Average: 25.6	.93	

Borough of Halifax

Summary. Market Ward. Area 600. 3710 Sup. Yards

Year	Dwellings		[illegible]		[illegible]	[illegible]	Excess		[illegible]	Deaths from							Annual death rate per 1,000 persons		[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]			Births	Deaths		Small pox	[illegible]	[illegible]	Measles	Diarrhoea	[illegible]	[illegible]	From all causes	From [illegible]	
1865	728	—	—	—	115	104	11	—	3938	1	1	2	—	—	2	—	26.2	1.51	—
6	732	4	—	—	102	100	2	—	3970	1	—	1	—	—	1	—	25.1	.75	—
7	732	—	—	—	115	85	30	—	4000	—	—	1	—	—	1	—	21.2	.5	—
8	738	6	—	—	124	105	19	—	4019	—	2	1	—	1	—	—	26.1	.99	—
9	759	21	—	—	107	100	7	—	4026	—	—	2	—	—	—	—	24.8	.49	—
1870	768	9	11	11	117	129	—	12	4014	—	1	—	—	—	2	—	32.1	.74	2.7
1	794	26	85	96	125	97	28	—	4042	—	—	2	—	2	2	—	24.0	1.48	23.7
2	809	15	84	180	101	94	7	—	4049	—	—	1	—	—	1	—	23.2	.49	[illegible]
3	830	21	18	198	120	77	43	—	4094	1	—	1	—	—	—	—	19.3	.48	46.3
4	851	21	6	204	103	84	19	—	4113	—		2	—	—	—	—	20.4	.72	[illegible]
1875	888	37	8	212	101	86	15	—	4128	—	—	1	—	—	—	—	20.8	.24	57.8
Total for whole Period	—	160	212	—	1234	1053	171	[illegible]		7	5	14	—	3	9	—	[illegible] 23.7	.76	

Borough of Halifax

Summary East Ward. Area 308.429 Sup. Yards

Year	Dwellings		[illegible]				Excess			Deaths							Annual Death Rate per 1,000 persons		
	[illegible]	Increase or Decrease	[illegible]	[illegible]	[illegible]	[illegible]	Births	Deaths	Annually Estimated Population	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	from All Causes	from Fevers	[illegible]
1865	1130	—	—	—	233	201	32	—	4730	2	—	1	—	1	3	—	42.0	1.47	—
6	1134	4	—	—	242	158	84	—	4814	3	—	—	—	—	—	—	32.8	.62	—
7	1134	—	—	—	202	147	55	—	4869	Nil							30.1	—	—
8	1139	5	—	—	234	179	55	—	4924	1	1	1	—	—	2	—	36.3	1.01	—
9	1143	4	—	—	205	168	37	—	4941	—	—	2	—	—	—	—	33.8	.40	—
1870	1143	—	21	21	242	160	82	—	5023	—	—	4	—	1	1	—	[illegible]	[illegible]	[illegible]
1	1156	13	116	137	206	160	46	—	5080	4	—	4	—	—	—	—	[illegible]	[illegible]	[illegible]
2	1141	Decrease 15	63	200	174	139	35	—	5124	—	—	8	—	—	1	—	[illegible]	[illegible]	[illegible]
3	1142	1	125	245	196	124	72	—	5796	1	—	2	—	—	—	—	[illegible]	[illegible]	[illegible]
4	1145	3	22	267	170	155	15	—	5211	—	—	7	—	—	—	—	[illegible]	[illegible]	[illegible]
1875	1145	Decrease 7	13	280	190	149	41	—	5252	—	1	5	—	—	2	—	[illegible]	[illegible]	[illegible]
[illegible]	—	[illegible]	[illegible]	—	2294	1740	554	—		11	2	34	—	2	9	—	[illegible]	[illegible]	

Borough of Halifax

Summary. Southowram Ward. Area 339,852¾ Supl Yards

Year	[illegible]		[illegible]		Number of Births Registered Annually	Total No. of Deaths from all Causes Registered Annually	Excess.		Annually Estimated Population	Deaths. — From —							Annual Death rate per 1,000 living		[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]			Births	Deaths		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	From all Causes	[illegible]	
1865	1056	—	—	—	226	164	62	—	4519	1	2	10	—	—	2	—	36.2	3.31	—
6	1077	21	—	—	242	120	122	—	4644	1	1	3	—	—	—	—	25.8	1.07	—
7	1096	19	—	—	228	158	70	—	4711	2	3	6	—	1	2	—	33.5	2.97	—
8	1109	13	—	—	228	106	122	—	4833	—	—	—	—	—	2	—	21.9	.41	—
9	1122	13	—	—	224	108	116	—	4949	—	—	2	—	1	—	—	21.5	.60	—
1870	1140	18	—	—	210	160	50	—	4999	—	2	1	—	—	2	—	32.0	1.0	—
1	1156	16	8	8	195	134	61	—	5060	—	—	5	—	—	4	—	26.4	1.7	1.5
2	1167	11	27	35	229	156	73	—	5133	—	1	15	—	1	—	—	30.3	3.31	6.8
3	1183	16	18	53	183	112	71	—	5224	1	1	4	—	—	—	—	21.5	1.15	10.1
4	1181	diminution 2	10	63	236	156	80	—	5284	—	—	7	—	2	3	—	29.5	2.27	11.9
1875	1196	15	31	94	193	135	58	—	5342	—	—	10	—	—	4	—	[illegible]	2.62	[illegible]
[illegible]	—	140	94	—	2394	1509	885	—		5	10	63	—	5	19	—	Averages [illegible]		

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Borough of Halifax

Summary. Mount Pleasant Ward. Area 3400.908 Superficial yards

Year.	Dwellings		Water Closets		Number of Births Registered annually	Total No. of Deaths in the Ward Registered annually	Excess		Approximately Estimated Population	Deaths							Annual Death rate per 1,000 persons		[illegible]
	No. of inhabited Houses annually registered	Annual Increase of Dwellings	Number Registered Annually	Total No. upon the Register annually			Births	Deaths		From							From All Causes	From Fevers	
										Variola	Rubeola	Scarlatina or Diphtheria	Pertussis	Gastric	Typhus	Relapsing			
1865	876	—	—	—	201	127	74	—	6232	1	—	—	—	1	4	—	23.3	.95	—
6	904	28	—	—	210	124	86	—	6338	2	—	—	—	—	3	—	19.5	.78	—
7	972	68	—	—	222	85	137	—	6475	—	—	Nil	—	—	—	—	13.1	—	—
8	1096	124	—	—	201	136	65	—	6540	—	—	2	—	2	1	—	20.7	.76	—
9	1104	8	—	—	215	144	71	—	6611	1	1	4	—	1	—	—	21.7	1.05	—
1870	1164	60	9	9	237	147	90	—	6701	—	1	—	—	—	—	—	21.9	[illegible]	1.3
1	1231	67	71	80	235	151	84	—	6785	—	—	1	—	—	—	—	22.2	[illegible]	11.7
2	1252	21	87	167	220	133	87	—	6872	—	—	2	—	—	—	—	19.5	.29	24.3
3	1297	45	53	220	244	114	130	—	7002	—	—	1	—	—	—	—	16.3	.14	31.4
4	1362	65	19	239	254	146	108	—	7110	1	—	2	—	—	1	—	20.5	.28	33.6
1875	1465	103	39	278	262	145	117	—	7227	—	—	2	—	—	—	—	20.0	.27	38.4
Total for whole Period	—	589	278	—	2501	1452	1049	—		5	2	14	—	4	9	—	Average 19.6	.22	

Borough of Halifax

General Summary (whole Boro') for the year 1865.

Name of Ward	Dwellings		[illegible] Closets		No. of Births Registered during the year	Total No. of Deaths from all Causes during the year	Excess		Estimated Population	Deaths. From							Annual Death Rate per 1,000 living		[illegible]
	No. entered in the Rate Books Inhabited & [illegible] the Year	Increase or Decrease	No. Registered during the Year	Total No. upon the Register			Births	Deaths		[illegible]	[illegible]	Enteric or Typhoid	[illegible]	Gastric	Typhus	Relapsing	From All Causes	From Fevers	
Ovenden	835	—	—	—	187	105	82	—	3964	—	—	2	—	1	2	—	26.4	1.26	—
Northowram	1013	—	—	—	199	113	86	—	6176	—	—	1	—	1	1	—	18.2	.48	—
North	1089	—	—	—	266	169	97	—	5346	1	—	2	1	3	—	—	31.6	1.30	—
Central	1526	—	—	—	286	186	70	—	8245	1	—	1	—	—	1	—	22.5	.36	—
West ※	1601	—	—	—	232	268	—	36	11117	7	1	5	1	1	4	—	24.1	1.70	—
South	1288	—	—	—	181	173	8	—	7049	2	—	1	1	—	3	—	24.6	.97	—
Market	728	—	—	—	115	104	11	—	3968	1	1	2	—	—	2	—	26.2	1.51	—
East	1130	—	—	—	233	201	32	—	4790	2	—	1	—	1	3	—	18.0	1.47	—
Southowram	1056	—	—	—	226	164	62	—	4819	1	2	10	—	—	2	—	34.2	2.31	—
Skircoat	876	—	—	—	201	127	74	—	6252	1	—	—	—	1	4	—	20.3	.95	—
Total for the whole Boro.	11824	—	—	—	2066	1610	486 nett		61874	16	4	25	3	8	22	—	Average 26.2	1.27	

※ Union Workhouse returns (page 30)

Borough of Halifax.

General Summary (whole Boro') for the year 1866

Name of Ward.	Dwellings		[illegible]				Excess			Deaths							Proportion of Deaths to 1000 persons		
										Fevers									
	No. upon the Rate Books Assessable to the Poor	Increase of Assessments	No. registered during the year	Total No. upon the Register	No. of Births registered during the year	Total No. of Deaths from all Causes during the year	Births	Deaths	Estimated Population	Scarlatina	Continued	Enteric or Typhoid	[illegible]	Gastric	Typhus	Relapsed	From all Causes	From Fevers	Ratio of [illegible]
Ovenden	846	8	—	—	147	107	40	—	4004	5	1	—	—	—	3	—	26.7	2.24	—
Northowram	1112	99	—	—	194	104	90	—	6266	—	3	2	—	—	1	—	16.5	.95	—
North	1118	29	—	—	231	153	78	—	5424	—	1	6	1	—	—	—	28.2	1.47	—
Central	1601	75	—	—	267	184	83	—	8337	1	1	3	—	1	4	—	22.0	1.19	—
West *	1584	83	—	—	271	272	—	1	11116	2	—	3	—	1	4	—	[illegible]	.89	—
South	1315	27	—	—	169	130	39	—	7088	1	1	—	—	—	2	—	18.3	.56	—
Market	732	4	—	—	102	100	2	—	3970	1	—	1	—	—	1	—	25.1	.75	—
East	1134	4	—	—	242	158	84	—	4814	3	—	—	—	—	—	—	32.8	.62	—
Southowram	1077	21	—	—	242	120	122	—	4641	1	1	3	—	—	—	—	25.8	1.07	—
Skircoat	954	28	—	—	210	124	86	—	6338	2	—	—	—	—	3	—	19.5	.78	—
Total for the whole Boro'	11423	378	—	—	2075	1452	623	excess	61998	16	8	18	1	2	18	—	Average 23.4	1.01	

* Union Workhouse returns (page 30)

Borough of Halifax

General Summary (whole Boro') for the Year 1867.

Name of Ward	Dwellings: No. upon the Public Health Act applied to the Poor	Dwellings: Increase of [illegible]	Common Courts: No. Drained during the Year	Common Courts: Total No. upon the Register	No. of Births registered during the year	Total No. of Deaths from all causes during the year	Excess: Births	Excess: Deaths	Estimated Population	Deaths. Fevers: Simple	Continued	Enteric or Typhoid	[illegible]	[illegible]	Typhus	Relapsing	Annual Death rate per 1.000 persons: From all causes	Annual Death rate per 1.000 persons: From Fevers	Rate of [illegible] Borough [illegible] per 1.000 [illegible]
Ovenden	878	32	—	—	157	124	33	—	14037	—	—	1	—	—	—	—	30.7	.24	—
Northowram	1149	37	—	—	184	86	98	—	6364	1	—	1	—	1	1	—	13.5	.62	—
North.	1129	11	—	—	264	144	120	—	3544	—	—	2	1	—	—	—	25.9	.54	—
Central	1655	54	—	—	245	175	70	—	8407	—	—	1	—	1	—	—	20.8	.23	—
West ※	1675	91	—	—	310	248	62	—	11178	2	—	1	—	—	—	—	22.1	.26	—
South	1348	93	—	—	196	185	11	—	7094	1	—	2	—	—	1	—	26.0	.56	—
Market	732	—	—	—	115	85	30	—	4050	—	—	1	—	—	1	—	21.2	.5	—
East	1134	—	—	—	202	147	55	—	4859			Nil					30.1	—	—
Southowram	1096	19	—	—	228	158	70	—	4711	2	3	6	—	1	2	—	33.5	2.97	—
Skircoat	972	68	—	—	222	55	134	—	5213			Nil					10.1	—	—
Total for the whole Boro'	11768	345	—	—	2123	1437	[illegible]	—	[illegible]	6	3	15	1	3	5	—	Average 22.9	.32	

※ Union Workhouse returns (page 30)

Borough of Halifax

General Summary (Whole Boro') for the year 1868.

Name of Ward.	Dwellings		[illegible]				Excess			Deaths — Fevers							Annual Death rate per 1,000 persons		
	No. upon the Rate Books assessed to the Poor	Increase of Assessments	No. Registered during the year	No. on the Register	No. of Births registered during the year	Total No. of Deaths from all Causes during the year	Births	Deaths	Estimated Population	Simple	Continued	Enteric or Typhoid	Remittent	Gastric	Typhus	Relapsing	From all Causes	From Fevers	Rate of [illegible] per 1,000 persons
Ovenden	882	4	—	—	166	88	78	—	4115	2	—	2	—	—	—	—	21.3	.97	—
Northowram	1242	93	—	—	238	123	115	—	6479	1	1	1	—	1	—	—	18.9	.61	—
North	1155	26	—	—	239	159	79	—	5623	1	—	3	1	—	2	—	28.2	1.24	—
Central	1699	44	—	—	302	234	68	—	8475	3	2	4	—	1	—	—	27.6	1.17	—
West ※	1764	89	—	—	313	299	14	—	11192	2	1	3	—	1	—	—	26.7	.62	—
South	1387	39	—	—	199	156	43	—	7142	2	—	1	—	—	2	—	21.8	.70	—
Market	738	6	—	—	124	105	19	—	4019	—	2	1	—	1	—	—	26.1	.99	—
East	1139	5	—	—	234	179	55	—	4924	1	1	1	—	—	2	—	36.3	1.01	—
Southowram	1109	13	—	—	228	106	122	—	4833	—	—	—	—	—	2	—	21.9	.41	—
Skircoat	1096	124	—	—	200	136	65	—	6540	—	—	2	—	2	1	—	20.7	.76	—
Total for the whole Boro'	12211	443	—	—	2243	1585	658	—	63342	12	7	18	1	6	9	—	Average 28.0	.83	

※ Union Workhouse returns (page 30)

Borough of Halifax

General Summary (whole Boro') for the year 1869.

Name of Ward	Dwellings		Com. Ho.		[illegible]	[illegible]	[illegible]		[illegible]	Deaths							[illegible]		[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	904	22	—	—	138	103	88	—	4170	—	1	—	—	—	—	—	20.7	.33	—
Northowram	1324	82	—	—	227	119	128	—	6584	—	—	2	—	1	—	—	18.0	.46	—
North	1169	14	—	—	262	168	74	—	8097	—	1	2	—	—	2	—	32.0	.87	—
Central	1535	109	—	—	[illegible]	172	95	—	8070	—	—	3	—	1	2	—	30.0	.69	—
West	1814	33	—	—	348	248	40	—	11242	2	—	—	—	—	1	—	30.5	.35	—
South	1487	100	—	—	191	200	—	3	7139	2	—	—	—	1	1	—	22.0	.16	—
Market	754	21	—	—	107	100	7	—	4122	—	—	2	—	—	—	—	24.0	.44	—
East	1143	4	—	—	205	165	37	—	4050	—	—	2	—	—	—	—	32.0	.40	—
Southowram	1122	13	—	—	220	104	16	—	4947	—	—	2	—	1	—	—	21.8	.60	—
Skircoat	1192	6	—	—	215	164	11	—	6611	1	1	44	—	1	—	—	20.7	.48	—
Total for the whole Boro'	12632	428	—	—	2233	1600	51	—	69452	5	3	21	—	[illegible]	8	—	Average 25.	.7	

Including ※ Union Workhouse returns (page 30)

Borough of Halifax

Annual Summary (whole town) for the year 18[illegible]

Name of Ward	Dwellings		[illegible]		[illegible]	[illegible]	Excess		[illegible]	Deaths Zymotic							Annual [illegible]		[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Population	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Ovenden	965	61	—	—	185	140	45	—	4215	2	—	2	—	—	—	—	32.2	.94	—
Northowram	1340	16	—	—	224	151	65	—	6650	2	1	4	—	—	—	—	24.2	1.05	—
North	1171	2	9	9	263	201	56	—	5753	—	2	3	—	—	—	—	32.9	.86	1.3
Central	1960	152	19	19	300	268	32	—	8002	1	1	3	—	—	2	1	31.1	.93	2.2
West ✻	2130	316	42	42	402	428	—	26	11216	5	1	2	—	—	7	—	32.1	1.07	3.7
South	1594	107	27	27	240	231	9	—	7148	1	—	10	—	1	2	—	32.3	1.45	3.7
[illegible]	768	9	11	11	117	129	—	12	4014	—	1	—	—	—	2	—	32.1	.74	2.7
East	1143	—	21	21	242	160	82	—	5643	—	—	4	—	1	1	—	31.7	1.18	[illegible]
Southowram	1140	18	—	—	210	160	50	—	4997	—	2	1	—	—	2	—	22.0	.10	—
Skircoat	1164	60	9	9	237	[illegible]	90	—	6701	—	1	—	—	—	—	—	31.9	.4	1.3
Total for the whole Boro.	13375	741	138	138	2420	[illegible]	389	nil	64345	11	9	33	—	2	16	1	Average 31.5	1.1	2.[illegible]

Including ✻ Union Workhouse returns (page 30)

Borough of [illegible]

General Summary (whole Boro') for the year 1871

Name of Ward	Dwellings		Pan Closets		[illegible]	[illegible]	Cases		[illegible]	Death from							Corresponding Death rate per 1,000 persons		[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	999	34	31	31	171	98	73	—	4288	3	—	1	1	—	—	—	22.8	1.06	7.2
[illegible]	1348	3	43	43	462	[illegible]	148	—	6798	1	—	1	—	1	4	—	17.3	1.02	12.2
North	1179	8	76	87	239	182	67	—	5810	1	—	6	—	1	—	—	31.3	1.37	14.9
Central	1974	14	111	130	310	211	99	—	8701	—	—	7	—	—	1	1	24.2	1.03	14.9
West ※	2319	189	202	240	414	323	91	—	11307	2	—	4	—	1	2	—	22.5	.79	21.7
South	1642	46	127	184	233	179	64	—	7732	—	—	6	—	—	—	—	21.8	.93	21.8
Market	794	26	85	96	125	97	28	—	4042	—	—	2	—	2	2	—	24.0	1.48	23.7
East	1156	13	113	137	266	160	106	—	5089	4	—	1	—	—	—	—	31.4	1.57	26.7
[illegible]	1156	16	8	8	195	134	61	—	5860	—	—	4	—	—	1	—	21.4	1.71	1.5
[illegible]	1231	64	7	30	235	197	34	—	[illegible]	—	—	1	—	—	—	—	22.2	.4	11.7
[illegible]	13773	416	944	1062	2392	[illegible]	721	—	[illegible]	11	—	[illegible]	[illegible]	[illegible]	9	[illegible]	Average 23.3	1.09	[illegible]

Including ※ Union Workhouse returns (page 30)

Borough of Halifax

General Summary (Whole Town) for the year 1872.

Names of Ward.	Dwellings		[illegible]		[illegible]	[illegible]	Excess		[illegible]	Deaths							Annual Death rate per 1000 Living		[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Ovenden	1093	94	70	121	197	140	57	—	4848	5	—	11	—	—	2	—	32.1	4.44	27.6
Northowram	1343	—	17	100	270	118	152	—	6950	1	—	6	—	—	1	—	16.9	1.15	14.3
North	1155	6	46	133	233	163	70	—	5850	—	—	4	—	—	—	—	27.7	.68	22.6
Central	1984	10	84	214	308	227	81	—	8782	—	—	17	—	1	—	—	25.8	2.04	21.3
West ※	2525	216	20	266	413	350	63	—	11876	1	—	9	—	—	—	—	30.7	.87	33.1
South	1729	87	155	307	237	197	40	—	7242	2	—	12	—	—	2	—	27.1	2.20	[illegible]
Market	809	15	84	180	107	94	7	—	4049	—	—	1	—	—	1	—	23.2	.49	26.4
East	1141	15	53	200	174	139	35	—	5124	—	—	8	—	—	1	—	27.1	1.75	34.0
† Southowram	1165	11	27	35	229	156	73	—	5133	—	1	15	—	1	—	—	30.3	3.31	[illegible]
Skircoat	1252	21	84	154	220	135	85	—	6872	—	—	2	—	—	—	—	19.9	.29	21.3
Total for the whole Boro'	14225	[illegible] 435	[illegible]	1832	2382	1711	665	—	[illegible]	9	1	85	—	2	7	—	Average [illegible]	[illegible]	[illegible]

Including ※ Union Workhouse } returns (page 40)
+ Borough Hospital

Borough of Halifax

General Summary (Wards) for the year 18[illegible]

Name of Ward	Dwellings		[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	Deaths							Annual Death-rate per 1,000 persons		[illegible]
										Fevers									
	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Ovenden	1128	35	53	174	189	103	66	—	4431	—	—	5	—	—	—	—	23.2	1.12	39.2
Northowram	1335	12	17	117	262	121	141	—	7091	—	—	2	—	—	—	—	17.0	.28	16.5
North	1185	—	28	161	238	155	63	—	5963	1	—	4	—	—	—	—	26.0	.83	27.0
Central	2077	17	34	248	319	177	142	—	8924	—	—	7	1	—	—	—	19.8	.84	27.7
West ※	2573	68	143	509	398	343	45	—	11425	1	1	6	—	—	—	—	30.4	.70	40.5
South	1854	125	121	428	282	212	70	—	7312	—	1	6	—	—	—	—	28.4	.95	38.5
Market	830	21	18	198	124	79	45	—	4094	1	—	1	—	—	—	—	19.3	.48	48.3
East	1142	1	45	245	196	124	72	—	3796	1	—	2	—	—	—	—	23.8	.57	47.1
+ Southowram	1183	16	18	53	183	112	79	—	5204	1	1	4	—	—	—	—	21.5	1.15	10.1
Skircoat	1237	46	53	220	244	111	130	—	7802	—	—	1	—	—	—	—	16.2	.44	31.4
Totals for Whole Borough	14568	340	530	2353	2435	1541	853	—	66042	5	3	38	1	—	—	—	Average 23.1	.70	35.3

Including { ※ Union Workhouse
+ Borough Hospital } returns (page 30)

26.

Borough of Halifax

General Summary (whole Boro') for the year. 1874.

Name of Ward	Dwellings		Privy Closets		[illegible]	[illegible]	Each		[illegible]	Deaths from							Annual Death rate per 1,000 living		[illegible]
	[illegible]	Increase of [illegible]	[illegible]	[illegible]			[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Ovenden	1160	32	49	223	222	128	94	—	4028	—	—	2	—	—	—	—	28.2	.44	49.2
Northowram	1357	2	17	134	273	169	124	—	7495	—	—	6	—	—	1	—	23.5	.97	15.6
North	1187	2	24	185	245	177	68	—	6032	1	—	1	—	—	—	—	24.3	.33	30.6
Central	2010	9	52	200	337	223	114	—	9930	—	—	6	—	—	—	—	24.6	.66	33.5
West. ※	2695	102	71	380	421	419	2	—	11427	—	—	4	—	1	—	—	31.6	.43	50.7
South.	1912	58	108	536	279	265	28	—	7340	2	—	1	—	—	1	1	30.1	.81	72.0
Market	857	21	6	204	103	84	19	—	4113	—	1	2	—	—	—	—	20.4	.72	49.5
East	1145	3	22	247	170	133	15	—	5211	—	—	7	—	—	—	—	29.7	1.34	47.2
† Southowram	1187	decrease 2	10	63	236	136	80	—	5224	—	—	7	—	2	3	—	29.5	2.27	11.9
Skircoat	1362	65	19	230	252	146	101	—	7110	1	—	2	—	—	1	—	20.5	.56	33.6
Total for the whole Boro'	14860	Nett 292	378	2781	2540	1902	32	—	67374	5	1	38	—	3	6	1	Average 25.3	.50	40.8

※ Including Union Workhouse }
† — " — Borough Hospital } returns (page 30)

Borough of Halifax

General Summary (Whole Boro') for the year 1876.

Name of Ward.	Dwellings		Open [illegible]		[illegible]	[illegible]	Cases.		[illegible]	Deaths — Fevers							[illegible] Death rate per 1000 [illegible]		[illegible]
Ovenden	1201	41	23	246	285	95	108	—	11633	—	—	—	1	1	—	—	21.1	.49	33.0
Northowram	1402	45	37	155	302	104	132	—	7323	—	—	6	—	—	1	—	22.9	1.22	25.2
North	1266	19	17	202	275	172	98	—	6129	—	—	9	—	—	—	—	27.0	1.46	32.9
Central	2053	43	64	364	300	216	84	—	9122	1	2	5	—	—	—	—	23.6	.67	39.9
West ※	2799	104	144	614	468	379	89	—	11646	2	3	6	1	—	1	—	32.9	1.92	53.3
South	2154	242	48	384	299	195	78	—	7436	—	—	1	—	—	—	—	26.2	.18	78.5
Market	888	35	8	212	101	96	15	—	4128	—	—	1	—	—	—	—	20.8	.24	57.3
East	1140	[illegible] 5	13	280	190	149	41	—	5252	—	1	5	—	—	2	—	28.3	1.32	33.3
+ Southowram	1196	15	34	97	193	135	58	—	5342	—	—	10	—	—	4	—	25.2	2.62	18.1
Skircoat	1465	103	39	278	262	145	117	—	12227	—	—	2	—	—	—	—	20.0	.37	28.4
Total for the whole Boro'	15504	644	331	3062	2585	1739	846	—	68120	3	6	46	2	1	8	—	Average 25.5	.96	44.9

※ Including Union Workhouse } returns (page 30)
+ —„— Borough Hospital }

Borough of Halifax.

Grand Summary of Wards.

Name of Ward.	Area	Dwellings: No. upon the Rate Books assessed to the Poor				Water Closets			Total No. of Births & Deaths from all causes registered from 31 Dec 1864 to 31 Dec 1875		Net excess of births over deaths	% of natural increase of population per an.	Estimated Population		Density of Population Superf. yards per each Inhabitant		Average Mortality per 1.000 persons per annum	
	Sup. Yards	1865	1875	No. of increase	% of increase	Year of introduction	Total No. erected to 31st Dec 1875	Average ratio of introduction per 1000 persons per an.	Births	Deaths			1864	1875	1864	1875	All causes	Fever
Ovenden	2.577.390¾	835	1201	363	4.3	1871	246	35.3	1955	1234	721	1.6	3912	4633	663	556	26.4	1.15
Northowram	3.340.178	1018	1402	384	3.8	1871	185	17.4	2659	1346	[illegible]	1.7	6040	7333	554	[illegible]	[illegible]	.81
North	442.255	1089	1206	117	1.0	1870	202	22.6	2749	1864	[illegible]	1.5	5244	6129	84	72	[illegible]	.99
Central	408.495	1530	1083	[illegible]	[illegible]	1870	364	33.7	3211	2273	938	1.0	5164	4122	44	44	[illegible]	.92
West ※	1.579.208½	1501	2799	1298	8.5	1870	614	34.3	3940	3627	363	.3	11163	11516	141	137	29.2	.94
South	1.437.515½	1288	2154	866	6.7	1870	582	16.2	[illegible]	2109	397	.5	7041	7438	275	260	26.6	.98
Trinity	604.516	728	888	160	2.1	1870	215	34.7	1234	1063	171	.4	3957	4128	152	146	22.9	.76
East	305.424	1130	1140	10	.08	1870	200	37.	2294	1740	554	1.0	4692	5242	65	58	31.5	1.05
+ Southowram	3.594.644¾	1056	1196	140	1.3	1871	47	4.7	[illegible]	1809	885	1.6	4457	5342	805	672	27.5	1.16
Skircoat	3.405.909	870	1465	595	6.6	1870	274	23.5	2501	1452	1049	1.5	6178	7227	551	471	19.6	[illegible]
Whole Town	18.240.220¼	10465	15504	4459	4.0	—	3005	27.7	25473	18272	7201	1.1	60919	68120	299	267	25.6	.96

※ Including Union Workhouse } returns page 30
+ " " Borough Hospital }

Borough of Halifax

Grand Summary (Whole Boro). Area 18.240.840 Sqr Yards

Year	Dwellings		[illegible] Closets		[illegible] Births [illegible]	[illegible] Deaths [illegible]	Excess		[illegible]	Deaths							Death Rate per 1000 persons from		[illegible] per 1,000 persons
	[illegible]	[illegible]	[illegible]	[illegible]			Births	Deaths		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
1865	11044	—	—	—	2066	1610	456	—	61378	16	4	25	3	8	22	—	26.2	1.27	—
6	11428	378	—	—	2075	1462	623	—	61998	16	8	18	1	2	18	—	23.4	1.01	—
7	11768	340	—	—	2123	1457	666	—	62674	6	3	15	1	3	5	—	22.9	.52	—
8	12211	443	—	—	2243	1585	655	—	63322	12	7	18	1	6	9	—	25.0	.83	—
9	12634	423	—	—	2210	1600	615	—	63952	5	3	21	—	5	12	—	25.0	.71	—
1870	13375	741	138	138	2420	2031	389	—	60841	11	9	26	—	2	16	1	31.5	1.15	2.1
1	13793	418	914	1052	2394	1653	741	—	65082	11	—	37	1	5	12	1	25.3	1.04	16.1
⁎ 2	14228	435	771	1823	2382	1717	665	—	65747	9	1	85	—	2	7	—	26.1	1.48	27.7
3	14568	340	530	2353	2435	1540	895	—	66642	5	3	38	1	—	—	—	23.1	.76	35.3
4	14860	292	378	2731	2540	1908	632	—	67374	5	1	38	—	3	4	1	28.3	.80	40.5
1875	15574	644	331	3062	2585	1739	846	—	68120	3	6	46	2	1	8	—	25.5	.96	44.9
Grand Total.	—	4459	3062	—	25473	18272	7201	—	—	99	45	376	10	37	116	3	25.6	.96	

N.B. This Table includes the Mortality in the Union Workhouse & Borough Hospital
⁎ The Borough Hospital instituted

Borough of Halifax

Summary of Fever Mortality in the Halifax Union Workhouse situate in West Ward

Year	Simple	Continued	Enteric or Typhoid	Remittent	Gastric	Typhus	Relapsing	Per Centage of Deaths to Total Number in	
								West Ward	Whole Boro'
1865	4	—	1	1	—	3	—	3.8	.55
6	2	—	2	—	—	—	—	1.47	.20
7	1	—	—	—	—	—	—	.4	.06
8	1	—	—	—	—	—	—	.3	.06
9	2	—	1	—	—	6	—	3.02	.56
1870	4	—	2	—	—	5	—	2.5	.54
1	—	—	1	—	—	—	—	.31	.06
2	—	—	1	—	—	—	—	.28	.05
3	—	—	1	—	—	—	—	.29	.06
4	—	—	Nil	—	—	—	—	—	—
1875	—	—	Nil	—	—	—	—	—	—
Total for Whole Period	14	—	9	—	1	14	—	1.04	.20

Summary of Fever Mortality in the Boro' Hospital situate in Southowram Ward.

Year	Simple	Continued	Enteric or Typhoid	Remittent	Gastric	Typhus	Relapsing	Percentage of Deaths to Total Number in	
								South^o Ward	Whole Boro.
1872	—	—	5	—	—	—	—	3.2	.29
3	—	—	1	—	—	—	—	.89	.06
4	—	—	1	—	2	3	—	3.84	.31
1875	—	—	5	—	—	3	—	5.92	.46
Total for Whole Period	—	—	12	—	2	6	—	1.32	.10

Borough of Halifax

Summary of Fever Cases admitted into the Poor's Hospital since its establishment.

Ovenden Ward

Years	Simple	Continued	Enteric or Typhoid	Remittent	Gastric	Typhus	Relapsing	Total
1872	—	—	5	—	—	—	—	5
3	—	—	1	—	—	1	—	2
4	2	—	1	—	—	—	—	3
1875	—	—	Nil	—	—	—	—	—
Total	2	—	7	—	—	1	—	10

Northowram Ward

Year	Simple	Continued	Enteric or Typhoid	Remittent	Gastric	Typhus	Relapsing	
1872	—	—	4	—	—	—	—	4
3	—	—	1	—	—	1	—	2
4	3	—	2	—	—	—	—	5
1875	—	—	5	—	—	—	—	5
Total	3	—	12	—	—	1	—	16

North Ward

1872	—	—	3	—	—	—	—	3
3	—	—	Nil	—	—	—	—	—
4	1	—	—	—	—	—	—	1
1875	2	—	5	—	—	—	—	7
Total	3	—	8	—	—	—	—	11

Central Ward

1872	—	—	2	—	—	—	—	2
3	—	—	2	—	—	—	1	3
4	4	—	1	—	—	1	—	6
1875	1	—	7	—	—	—	—	8
Total	5	—	12	—	—	1	1	19

West Ward

1872	—	—	6	—	—	—	1	7
3	1	—	—	—	—	—	—	1
4	2	—	2	—	—	1	—	5
1875	1	—	4	—	—	1	—	6
Total	4		12			2	1	19

South Ward

1872	—	—	Nil	—	—	—	—	—
3	—	—	2	—	—	—	—	2
4	1	—	2	—	—	—	—	3
1875	—	—	5	—	—	—	—	5
Total	1	—	9	—	—	—	—	10

Market Ward.

Year	Simple	Continued	Enteric or Typhoid	Remittent	Gastric	Typhus	Relapsing	
1872	–	–	1	–	–	–	–	1
3	–	–	Nil	–	–	–	–	–
4	1	–	1	–	–	–	–	2
1875	1	–	2	–	–	–	–	3
Total	2	–	4	–	–	–	–	6

East Ward.

Year	Simple	Continued	Enteric or Typhoid	Remittent	Gastric	Typhus	Relapsing	
1872	–	–	Nil	–	–	–	–	–
3	–	–	Nil	–	–	–	–	–
4	–	–	Nil	–	–	–	–	–
1875	–	–	3	–	–	3	–	6
Total	–	–	3	–	–	3	–	6

Southowram Ward.

1872	–	–	1	–	–	–	–	1
3	–	–	1	–	–	–	–	1
4	–	–	2	–	–	2	–	4
1875	–	–	4	–	–	–	–	4
Total	–	–	8	–	–	2	–	10

Skircoat Ward.

1872	–	–	Nil	–	–	–	–	–
3	–	–	Nil	–	–	–	–	–
4	2	–	–	–	–	1	–	3
1875	–	–	Nil	–	–	–	–	–
Total	2	–	–	–	–	1	–	3

Townships out of the Borough.

Year	Simple	Continued	Enteric or Typhoid	Remittent	Gastric	Typhus	Relapsing	
1872	–	–	Nil	–	–	–	–	–
3	–	–	Nil	–	–	–	–	–
4	2	–	–	–	–	–	–	2
1875	4	–	3	–	–	–	–	7
Total	6	–	3	–	–	–	–	9

Explanation of Diagram

This diagram has been designed as a Supplement or Key to the foregoing Tables to facilitate analysis.—

The Vertical Divisions, from the left to right, marked in strong lines, indicate the Whole Borough, "Anno Domini" being placed in the margin along the top.—

The Vertical Sub-divisions represent the ten Wards comprising the Boro', which are arranged in regular order, commencing with Ovenden Ward (see foot). For the sake of clearness each Ward, in like like manner, bears a distinguishing tint commencing with "yellow", and repeated,

The Horizontal Lines, form the Scale by which the rate of Mortality is indicated, every fifth line being rendered strong and figured in the margins left & right.—

The Black Triangles, not only illustrate the Annual Death-rate of each Ward, but, indicate the intensity of fluctuation for the time being

The Blue Horizontal Lines, furnish the Annual-rate of Mortality for the Whole Boro'.—

The Red Horizontal Lines, gives the Average Annual-Death-rate in periods; one of five & two of three years each.—

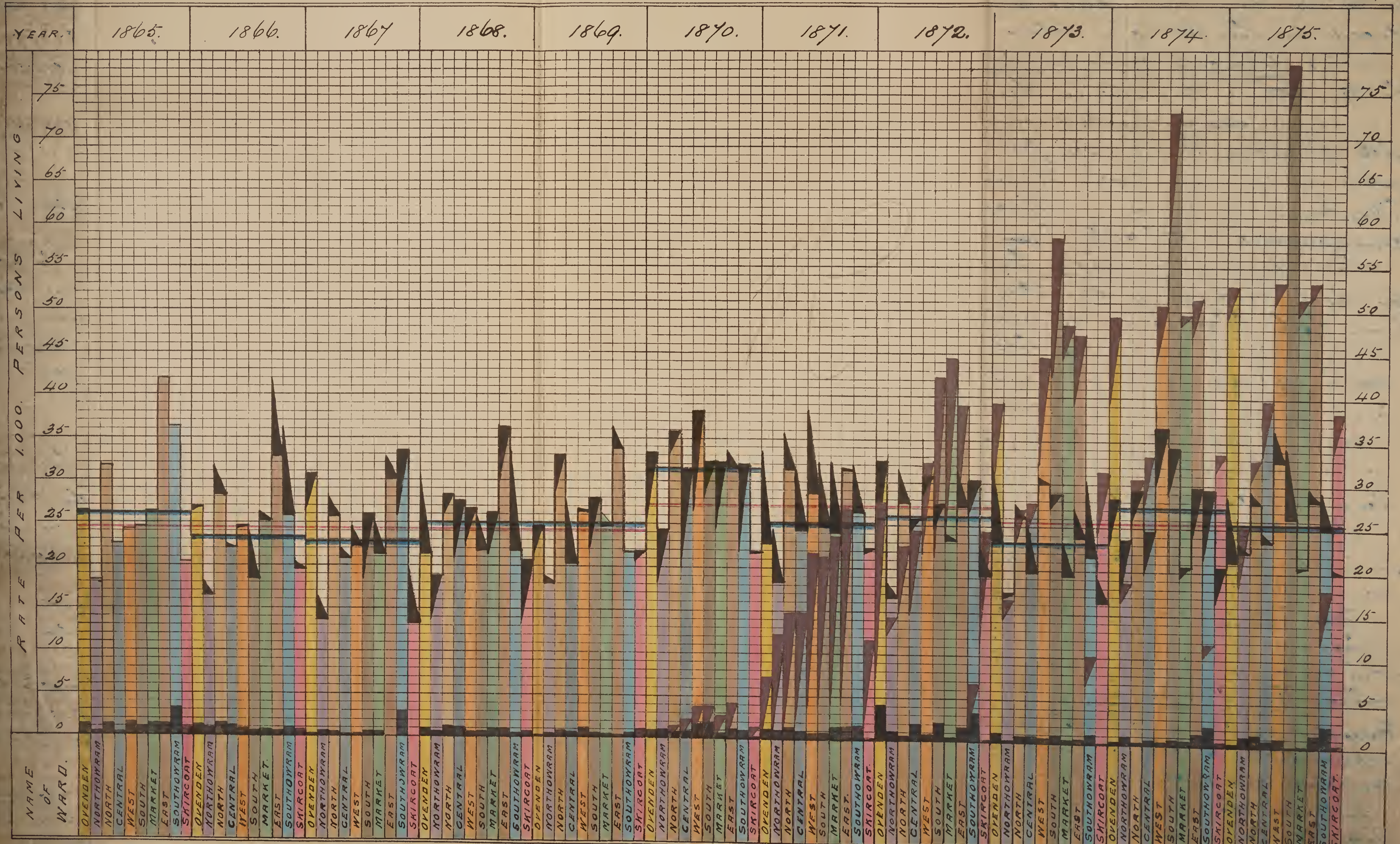
The Neutral Tint, at the base of the diagram, shows the Annual-rate of Fever Mortality, in each Ward.—

The Vermilion Triangles. denote the Number of Goux-Closets per 1,000 of the population & the Annual-rate of introduction in each Ward

And, the Vermilion Horizontal Lines denote the average Annual-rate of "Goux Accommodation" per 1,000 persons for the Whole Borough.—

Borough of Halifax

Diagram showing fluctuation of General Death-rate also the development of the "Goux System."



CHOLERA (SANDGATE).

RETURN to an Order of the Honourable The House of Commons,
dated 23 February 1855;—*for*,

Copy "of REPORT made by Mr. *Thomas E. Blackwell*, C. E., to the President of the General Board of Health (bearing date the 21st day of February 1855), on the Drainage and Water Supply of *Sandgate*, in connexion with the late Outbreak of Cholera in that Town."

Sandgate Inquiry.

To the President of the General Board of Health.

Sir,

In pursuance of instructions from the Secretary of the General Board of Health, dated 15th December 1854, requesting me to visit Sandgate, and examine into the circumstances of the drainage and water supply, in connexion with the late outbreak of cholera in that place, I beg to inform you that I have made such investigation, and now have the honour to lay before you the following Report.

The chief points to which my attention has been directed may be briefly stated;

Subjects of Inquiry.

1st. A general survey of the system of drainage lately laid down under the superintendence of the Local Board, with a more particular examination, by various openings made into the sewers, of their present state and action.

2d. An inquiry into the condition of the localities visited fatally by the disease; the particulars of the private drainage, the water used in the cases recorded, the presence or absence of cesspools, and other circumstances.

3d. The sources and quality of the water supply.

I feel pleasure in acknowledging the valuable co-operation of Mr. Tyssen, the Chairman, who accompanied me in a house to house inspection, and to the other members of the Local Board of Health, who have both personally, and by their very zealous officer, Mr. W. Pledge, afforded me the most ready access to documents and other information, and in opening the ground for my inspection whenever required. My thanks are due to Dr. Donnelly; also to Mr. Moseley, Surgeon, of Sandgate, who has assisted me with very valuable information as to the individual cases of cholera referred to in the tabular statements appended. I have also to acknowledge the attention of Mr. Rammell, the engineer of the combined works, who forwarded for my use plans and other documents. My thanks are also due to Mr. Harman, Builder, at Sandgate, the late Inspector of the Works. I am also under great obligation to Mr. J. S. Mackie, of Folkestone, and to Mr. Clarke, of Sandgate, Fellows of the Geological Society, who assisted me with their valuable geological knowledge of the locality. My thanks are also due to Mr. Hart, late Mayor, and Mr. Bamford, Surveyor to the Corporation of Folkestone, who afforded me the most ample means of examining the Folkestone district of sewers, within the township of Sandgate.

Town of Sandgate.

The town of Sandgate, its favourable situation, climate and other conditions, have been so fully described in reports lately presented to the General Board, that it seems unnecessary to enter into minute details on these points; at the same time, to make the subjoined remarks complete, it may be desirable to premise, that Sandgate is a somewhat irregularly built town, two miles west of Folkestone, extending about 1¼ mile along a shingly beach, and with the exception of some villa residences built on higher ground, situated at the foot of an undercliff of the lower green-sand formation. At least one half the houses in the lower part of the town are built entirely of wood. There are about 302 houses, and 1,400 inhabitants, increased by visitors during the summer season, by an average of from 50 to 100 per cent. Before the application of the Public Health Act in 1852, there appears to have been no general drainage of any kind, except in a small district at the east end, which is comprised in the township of Folkestone. This part was also supplied with water by the Folkestone Waterworks; the rest of the inhabitants obtained their water from private wells and pumps most objectionably situated, or from a public conduit, which there is reason to believe was also contaminated.

By the general testimony of the inhabitants, fever, diarrhœa and other diseases stated to be dependent on bad drainage, and impure water, had long been prevalent.

Drainage Districts.

For the purposes of drainage under the Act, the town was divided into two districts, the most eastern part, which lies within the township of Folkestone, forming a third, with separate system of drainage. The middle and most thickly inhabited district is newly drained by a system of pipe sewers, converging to a covered tidal reservoir on the beach, from which the sewage is discharged through a cast-iron pipe into the sea below low water. The western part of the town is also newly drained by pipes converging to a cast-iron outfall pipe, which also discharges into the sea; but here there is no sewage reservoir. The pipes are all of glazed ware, of fair quality, from six to twelve inches diameter; the joints both in the public sewers and private drains being formed with clay. They are laid at an average depth of from five to six feet beneath the surface, with inclinations, varying from 1 in 14 in the steeper parts of the town, to 1 in 240, and 1 in 320, in the larger and longer mains; the latter being the flattest gradient shown on the contract sections.

The private drains are almost invariably of four-inch glazed ware pipes.

The lengths of the said public sewers now in operation are, according to a statement by Mr. Rammell, one mile and 585 yards. The particulars and fall of each will be found in an Appendix (F.)

The new water supply will be hereafter noticed. The result of my inquiries tends to show, that since the completion of these works of drainage and water supply, notwithstanding their imperfect state, the before-mentioned diseases have considerably abated; and with the exception of the fatal outbreak of cholera, and the fever and diarrhœa which immediately preceded it, in the autumn of 1854, the health of the inhabitants is generally improved.

Re-laying of the new Sewers.

These inquiries further show, that from one cause or another, many portions of these new public sewers have been found obstructed; that on the representation of the Local Board to the engineer, and his consequent examination, it was discovered that many departures from the levels shown in the drawing had occurred in their laying; and a considerable length, amounting to 423 yards of nine-inch and 83 yards of twelve-inch pipe in the middle district, and about 177 yards of nine-inch in the western district, have had to be taken up and relaid by the contractor. (*Vide* Report of Mr. Rowe to Messrs. Rammell and Lister on this point, Appendix (E.) This amendment was completed in January 1853; subsequently, various other stoppages have occurred, and several other portions of pipe have been taken up and relaid under the superintendence of Mr. Pledge, acting for the Local Board. The loose nature of the shingly ground in which these pipes were laid, not allowing the trenches to be opened for any considerable length, required very constant and accurate supervision to ensure correctness of level. This, there is too much reason to believe, was not given.

Sewers examined.
Plan No. 1, at the end.

In order to satisfy myself as to the present action of these sewers, I have had nineteen openings made into them, at the points marked A to R, on the accompanying Plan, No. 1.—The results are as follows:

Middle District.

A.—Branch sewer in Bateman's opening, pipe six-inch diameter, laid originally at an inclination of 1 in 120, but since relaid from the dead end of the drain down to the point A, by Mr. Pledge, in consequence of repeated obstructions, at 1 in 70; found only a small quantity of recent sewage. A hydrant with flushing pipe, being at the upper end of the drain, the water was turned on and appeared for a few minutes to flow freely, but was soon bayed back, as if by some obstacle at the lower end or in the main sewer.

B.—Branch sewer in Flesher's opening, pipe six-inch diameter, inclination 1 in 120; found it completely blocked with sewage; on turning the water on from the water-closets of a house immediately below the opening, the sewage flowed back in the wrong direction of the drain, and so continued to flow and soak away.

On endeavouring to flush from the upper end of this sewer, the water would not come down; there must therefore have been an obstruction both above and below the opening made.

C.—Branch sewer, Quested's opening, pipe six-inch diameter, inclination 1 in 120; opened at two points, C, C^{1}. A small quantity of sewage only found in the pipe, but the joints leaking.

D.—Back-lane, pipe six-inch diameter, inclination 1 in 240; found the pipe almost full of semi-fluid sewage, which flowed from both directions into the opening for some time. The joints of the pipe in this case, though wet, were not leaking materially.

E.—Main in High-street; pipe nine inch diameter, inclination 1 in 240; on opening down, found the soil stained with sewage up to about $\frac{3}{4}$ the height of the pipe; three joints out of five, carefully uncovered, were leaking freely, discharging a black fetid sewage water into the shingle. The clay was almost entirely gone from some of the joints. This opening being near the junction of the branch from Town's Court, had the flushing hose applied at the end of the branch, which in about $1\frac{1}{2}$ minute brought down a considerable quantity of black (evidently not recent) sewage, together with large masses of comparatively recent matter; showing that although this branch has been lately re-laid at an inclination of 1 in 70, it is still not self-cleansing,

F.—Main sewer in High-street; pipe nine-inch diameter, inclination 1 in 240; found the pipe clean, with a considerable quantity of water from the undercliff running through.

G.—Main sewer in High-street, pipe nine-inch diameter, inclination 1 in 263; opened for a length of six joints, the whole of which were leaking, and the surrounding soil stained of a deep black colour; one of the pipes broken at the top; depth of sewage deposit in the pipe $1\frac{5}{8}$ inch. I then turned on the water for flushing at the dead end of the sewer, beyond H, and the depth of sewage brought down increased temporarily to $2\frac{3}{8}$ inch, then sank again to $1\frac{1}{2}$ inch, and soon stopped altogether, the water from the upper end, which was continued, making its escape at some intermediate point. The flushing hose was then removed to the branch sewer in Chapel-street, which joins the main at H, when the water soon found its way to G, and rose to the height of $3\frac{1}{4}$ inches. All the joints leaked copiously during the experiment.

H.—Main sewer, High-street, at junction of six-inch and nine-inch pipes, with the Chapel-street six-inch branch sewer. Found it in a very obstructed condition, and all the joints leaking. Three lengths of six-inch pipe were completely choked with soft deposit, the junction piece and three lengths of the nine-inch pipe were also about half full. In laying the pipe sewer, an old surface drain, which passed transversely at a higher level, had been broken into at the bottom and never properly repaired, and was then discharging water into the beach. The ground about this opening was much stained with sewage.

Since my visit, I have had a further examination made into the state of the sewers to the eastward of the military road, near the point marked R, and Mr. Pledge reports to me, that having opened that sewer at three intermediate distances of about 30 yards, he found 20 yards (here nine inches diameter), choked with deposit.

Outfall Sewage Tank.

The covered tank for sewage on the beach, receiving the drainage of the middle district, is a large egg-shaped culvert, 7 feet 6 inches by 5 feet, and about 59 feet long; having an internal capacity of about 1,600 cubic feet. On examination, it was found clean, and the action of the tidal valve at the discharge end, perfect and regular. The 12-inch pipe leading from this reservoir to the mains in the street, has been relaid since the original works were completed, so as to give it about one foot more fall in the length of 230 feet. One remarkable circumstance was observable; viz., that the marks of the sewage in this chamber showed that it had occasionally been filled to within nine inches of the top, covering up the mouth of the sewer to the extent of 1 foot 7 inches. Now, supposing the main sewers in the High-street to be laid at the levels intended, the effect of this submersion, on each occasion when the sewage in the tank rose thus high, would be to dam back the sewage water 90 yards up the eastern, and 130 yards up the western main; and to some extent the branches connected therewith, as shown on plan No. 1, by a dark shade over the portion of the streets thus affected. I can only account for the sewage water rising thus high in the tank, by supposing flushing to be carried on during the periods of high spring tides, or by an extraordinary rain-fall.

The drains above referred to are all comprised in the middle district. In the western system the following openings have been made, the particular points having been suggested by Mr. Pledge:—

Western District.

I.—At junction of east main sewer with outfall pipe, 9 inches diameter; inclination 1 in 240. Found a deposit of three inches, stiff black sewage and silt, with a little clean gravel on the top; a small quantity of water running, said to be from a brewery above. The ground about the joints much discoloured with leakage; no adhesion of the clay to the joints, which in this instance were full of insects (woodlice). The curve forming the junction of the main with the outfall pipe was formed of straight pieces, and an opening was in consequence left at the back of the curve, 1 ½ inch wide.

J.—Junction of west main with outfall pipe nine-inch diameter, inclination 1 in 263. Found a deposit of three inches stiff black offensive sewage, joints leaky, soil washed black.

K.—Main-pipe sewer, six-inch diameter, inclination 1 in 263. Found pipes at this place quite dry and clean, as if no sewage had ever passed through; there was an appearance of wash in the gravel under the pipe, as if the sewage or water had run below it. On taking the levels of this sewer, it was found to be five inches above its proper level.

L.—Main, above last, six-inch pipe, inclination 1 in 263. Found black deposit 2½ inches deep; no sewage flowing; ground much discoloured round joints.

M.—Upper end of same main. Found soft black deposit 1 ½ inch deep; no sewage running; ground much discoloured round joints.

Eastern District.

The eastern system, in the township of Folkestone consists of a circular brick culvert laid in cement, the upper, middle, and lower portions being respectively of 9-inch, 12-inch, and 14-inch diameters, with inclinations of 1 in 228, 1 in 439, and 1 in 310. I opened it at four places, N, O, P, Q, and found a deposit of moist sewage at N, of the depth of 2 ¼ inches; a drier deposit of sandy mud at O, 3 ½ inches; at P the same, 3 ½ inches; and at Q, a quite dry deposit, seven inches deep. It terminates on the beach in a well, having a self-acting flap valve to exclude the tidal water; the discharge thence being through a 12-inch cast-iron pipe, running nearly to low water. At my request the hose of the Folkestone waterworks was attached at the upper end of this drain; it took one hour 20 minutes before the water reached the well; whereas it should only have taken about 20 minutes, showing evidently a greater obstruction in some part than was revealed by the openings I have made. It eventually overcame this, and brought down a flood of foul sewage matter with it. The principal cause of obstruction in this culvert seems to be, an infiltration of sand through the gully gratings, and an insufficiency of water from the house-drains connected with it, to keep it clean with so flat a gradient.

Private Drainage.

The private drains, wherever I saw them open, were all jointed with clay, so that the liability to leakage observed in the public sewers may be anticipated to a still greater extent in these; the discharge from the water-closets acting as a repeated flushing, which must soon soften and wash away the clay. Many stoppages have occurred in these drains, and one case, that of Mr. Hill, which was examined during my visit, I am informed has since been again stopped, and the owner is now having it relaid with cement joints. The private drains are almost invariably trapped with syphon bends. There are but few rain-water pipes to the houses; but most of these are properly turned into the new drains.

Surface Drainage.

The system of surface drainage is very defective; nothing was provided for it in the original design; but the drainage of all yards and houses was systematically excluded from the new sewers. The result has been, that during the unsettled state of the operations of the Local Board, very little has been done to mitigate the evils of neglect in this particular. Some of the worse nuisances mentioned in Dr. Milroy's Report, as existing during the time of the cholera in August and September 1854, have been abated; but still enough are left to prejudice materially the public health. There are about four public surface drains, and one of these in a very imperfect state, still conveys discharges from stableyards and cowsheds, and until recently, that from a slaughter-house through the house of Mr. Harman, and thence across the New Inn-yard to the beach.

Inefficient state of the Sewers.

I will not attempt at this point to draw any conclusions as to how far the state of things above described may or may not have had the effect of aggravating the late attack of cholera. I feel it, however, to be a duty to say, that looking at the large proportion of those sewers which it was requisite to have taken up and relaid by the contractor, after the work was supposed to have been completed, the subsequent repairs and alterations that have since been found necessary from stoppages, and the present obstructed state of many parts observed in my examination, it appears to me that the new drainage works laid down under the superintendence of the Local Board, never have acted properly, and are still in an inefficient state.

Several causes have combined to bring about this result; the inaccuracies of level in laying down the pipes have already been alluded to, and though this may be amended in the parts taken up, there is reason to suppose that the same errors may pervade the whole work. Again, in connecting the private drains, after the mains were laid, I am informed that in many cases the former were not inserted in the proper junctions left for them, but into the nearest main pipe at which the ground was opened; while the proper junction piece was left as it had been originally, merely stopped with straw, which, as it rotted, allowed the loose shingle to fall into the main pipe, and so tend to create obstructions. But the principal cause of failure, in my opinion, is the method adopted of forming the joints of the pipes with clay only; this, as it is subjected to moisture and to pressure from within, must inevitably give way, and the whole system, from beginning to end, become, instead of an impermeable conduit, one more or less subject to leakage. The consequence is, that much of the liquid sewage escapes into the surrounding soil, leaving the solid matter behind; flushing then becomes necessary, but while it temporarily removes the obstruction, only aggravates the evil; the greater pressure and force of water then in action more effectually opening the joints.

Size of the Sewers and Drains.

In considering the new system of drainage at Sandgate, so far as regards the sizes of the public and private drains, their inclination, &c., I would say, that the diameters of the various pipes employed would be quite sufficient to carry off all the sewage they are designed for, provided it were always in a semi-fluid state, and washed with a due proportion of water; but inasmuch as in practice this is not the state of things, the use of so small a pipe as one of six inches diameter I cannot but regard as altogether injudicious as a public collecting sewer; it leaves no margin for the temporary reception of those foreign matters which by accident do, more or less, find their way through the house-drains, and must always be provided for. The quantity of water used in any single action of a water-closet, I believe, moreover, to be seldom sufficient to carry the whole contents from the pan at once down to the main sewer; but that a certain variable amount of paper or other matter generally remains for a time, and is only removed as it becomes in some measure decomposed. In such circumstances, a nine-inch pipe, while not materially increasing the expense, allows more than double the sectional area, without really losing much of the advantage of the scouring power of the water. The inclinations of the new sewers are quite sufficient to enable them to work well if made impermeable, and provided with an adequate supply of water. The size of the house-drains, I think, for the reasons above stated, too small for true economy or efficiency. Six inches diameter in most cases, and five inches at the least, I feel persuaded would work better.

Cases of Cholera.

For the illustration of the results of the second part of this inquiry, *i. e.* into the condition and circumstances of the localities visited by the cholera, I have appended Schedules of the fatal cases of cholera and non-fatal cases of choleraic diarrhœa, fever, &c., as they occurred, with the particulars of the water supply, state of drainage, and other details connected with each case. For obvious reasons, the initials only of the names are given. *See* Appendices (A.) and (B.) These are also laid down on the general map of the Town Plan, No. 1., and the order of occurrence of the fatal cases shown thereon in figures. And, in order to illustrate some remarks on the prejudicial effect which the remains of some of the former cesspools

Vide Plan No. 2 at the end.

may still exercise on the health of the inhabitants, a small portion of the town in which the cholera was very severe, is shown on an enlarged scale. [Plan No. 2.]

The following is an abstract of the information contained in the Schedules of cases above referred to:

SANDGATE.—Abstract of Cases of Cholera, &c., August and September 1854.

	Fatal Cases of Cholera.	Non-fatal Cases of Choleraic Diarrhœa, Fever, &c.
WATER SUPPLY.		
Number of cases in which the supply of water was derived entirely from Sandgate Waterworks - - - -	15	8
Number of cases in which the supply of water was derived entirely from Folkestone Waterworks - - - -	6	5
Number of cases in which the supply of water was derived partly from Sandgate Waterworks and partly from well or pump - - - - - - - - - -	7	12
Number of cases in which the supply of water was derived partly from Folkestone Waterworks and well - - -	3	2
Number of cases in which the supply of water was derived from well or pump . - - - - - - -	14	14
Number of cases in which there is no information - -	3	5
	48	46
CESSPOOLS.		
Number of cases on the premises of which there had been, previous to 1852, one or more cesspools - - - -	29	21
Number of cases in which there had never been cesspools -	16	19
Number of cases in which there is no information - -	3	6
	48	46

PRIVATE DRAINS.

	Fatal Cases of Cholera.	Non-fatal Cases of Choleraic Diarrhœa, Fever, &c.
Number of cases in which the house drain has been on some occasions blocked up - - - - - - - -	10	9
Number of cases in which it has not been found to be obstructed - - - - - - - - -	33	27
Number of cases in which there is no information - -	5	10
	48	46

Remarks on the Water used.

In examining the Schedule of Cases, we find under the head of "Source of Water Supply," a number of cases in which, while the Waterworks water is laid on, well or pump water was used for drinking. The reason appears to have been, in many cases, the greater apparent purity of the well water in comparison with that of the Waterworks, which deposited a sediment of an unpleasant appearance in the water bottles, &c.; in other cases, while the public water was used for cooking and cleansing purposes, the well or pump water was positively preferred as of better taste. Some of those wells and pumps, such as that of Mr. Aldis, and that at the New Inn, were locally celebrated for their reputed good qualities.

The per-centages of deaths and non-fatal cases occurring to persons who used the various waters are worthy of remark.

Taking the whole number, viz. 94, we find that of those who took water from

	Per Cent.
Sandgate Waterworks only, there were attacked	24·5
Folkestone Waterworks	11·7
Sandgate Waterworks and well or pump water	20·2
Folkestone Waterworks and well or pump water	5·3
Well or pump water only	29·8

Taking, however, the 48 fatal cases, of those who drank

Sandgate Waterworks only, there died	31·3
Folkestone Waterworks only	12·5
Sandgate Waterworks and wells	14·6
Folkestone Waterworks and well	6·3
Well or pump only	29·1

It appears that some few years ago, when the wells were the entire source of supply, great inconvenience was felt from the percolation of sea water through the beach, by which the water was rendered brackish. To remedy this, a wall was built at the expense of Lord Radnor extending along the beach (from Y to Z on Plan No. 1).

Cesspools.

Referring in Schedules (A) and (B.), to the head of "Whether up to the operation of the Public Health Act the premises had or had not cesspools," there is reason to believe, from the results of a more extended examination of a particular part of the town hereafter alluded to, that many of the cesspools set forth in the Schedule may have been very imperfectly closed, or if closed, that the impurities were only buried with beach thrown into them. It is important, however, to remark, that such is the extremely open character of the beach or shingle, that almost the entire contents are readily absorbed in a very short period; the emptying of cesspools before the construction of the new works was, therefore, of comparatively rare occurrence.

Cholera Map.

Few remarks are necessary on the Cholera Map, which shows at a glance where the severity of the disease was most felt. The perfect exemption of the western district is remarkable, although the houses in it, being more open and detached, are so far surrounded by more favourable circumstances. The first case, that of a lady residing at Barn House, near the west end of the town, appears, from the evidence obtained, not to have been imported.* The subsequent erratic order of occurrence of the cases is striking. It would have been beyond the objects of my inquiry, and is more a question of medical interest, to see if any connexion could be traced between some of these distant cases; but it is a subject not without interest, especially looking to such isolated cases as that of No. 40, at the extreme end of the town, and at a level of from 50 to 60 feet above the High-street, where the attack was most fatal.

Premises near Bellevue.

As such a very great mortality occurred in the block of houses comprised between the sea on the south side, and the High-street on the north, and between the courts called Quested's-opening and Town's-opening, I very carefully inspected the whole of these premises, with a view particularly to ascertain the existence of any remarkable local peculiarity, as of cesspools or defective drains, and the position of the wells from which it was alleged that water was used before and during the outbreak of cholera.

In the first instance, when accompanied by Mr. Wood, who undertook the chief part of the house connexions and the erection of water-closets, all knowledge of the present existence of cesspools was repudiated; there were some appearances, however, of dampness on the surface, and certain odours, which led me without difficulty and with little hesitation to open the ground. These openings are all marked on Plan, and the following is a description of the cesspools discovered.

Vide Plan No. 2, at the end.

No. 1, at the back of Bellevue House, is covered over with flag-stones, has about eight inches of wet soil in the bottom, apparently not cleaned out for some years, and obviously receiving from some adjacent source a sufficient quantity of water to keep the whole moist; the leakage probably arising from the adjacent water-closet, marked *a*.

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* This lady, with her husband and a friend, came to Sandgate as visitors in June. On the 24th August the lady and her friend were attacked with diarrhœa, and on the 26th the former died of cholera, her friend recovering. She had not been away from Sandgate since her arrival.

No. 2, a capacious cesspool in the back court of Mr. Marshall's house, now vacant. The cesspool on being opened, yielded offensive gases similar to those observed emanating from untrapped drains in the back kitchen of these premises.

No. 3 is at the house of the late Mr. George. This cesspool, about five feet deep, is in the yard close to the back door. It contained about three inches of foul matter at the bottom; on continuing the opening further, the cause of a leakage into the cesspool, and of the moisture of its contents, were traced to the leakage of one of the new house-drains (an obstructed four-inch glazed pipe) leading from the water-closet close by the well. There were also indications of moisture flowing into this cesspool through untrapped gratings in the yard. The openings from these gratings, it should be observed, are immediately beneath the bed-room windows of the late Mr. George.

No. 4 is a similar cesspool, in the back yard of the late Mr. Aldis (now Mr. Moseley), a surgeon. There are similar untrapped openings which convey into the cesspool the waste from the pump.

The two last cesspools are 32 feet apart from centre to centre; they are both constructed in the beach or shingle, and lined with loose bricks. About equidistant between these cesspools is sunk the common well, which affords the water supplied to the two houses. Without considerably disturbing the internal arrangements of the house, it would have been difficult to ascertain the position of water level in the well as compared with that of the two cesspools, but it is stated to be at about the average depth of 12 feet beneath the surface. Samples of the water have been taken, and are those referred to in the Analysis under the letter E. I should here observe, that to my own palate it had a vapid taste; it contained numerous white flocculi and a few crustaceans.

There is also one double cesspool, which formerly served for both the last-named houses, at a point marked 5. This cesspool, like some others, is said to be filled up; but whether completely closed or not, I cannot say, the space occupied by it having recently been built over, and it now lies below the ash-pit of a new kitchen communicating with Mr. George's house. The premises had been closed for about a fortnight, and when opened foul smells were very apparent. At a point about 24 feet to the south-east of the last-named double cesspool is the well from which Bellevue House supply of water is obtained.

Crossing the passage into Mr. Hill's premises, I found in the angle at (*b*) the descending pipe of a water-closet turning into a horizontal drain, which communicates with the drain from that and another water-closet on the ground floor. The horizontal drain was covered with slate, which had become broken; a loose board had been laid over part of the drain; but there was nothing to prevent the escape of the gases. The space shown on the Plan as an open passage, is glazed in like a hothouse, so that the vapours arising from the defective arrangements before referred to have free communication with the house.

Public Water Supply.

The public water supply of Sandgate is from three sources.

The Folkestone district is supplied by the Folkestone Waterworks Company. These derive their supply from springs in the lower chalk. The water is first taken into a depositing pool, and afterwards stored in the "Cherry Garden Reservoir," thence it is carried in a main to the town of Folkestone, a branch being led off to Sandgate, terminating near the Military-road. The level of the Folkestone reservoir is about 190 feet above Sandgate, at the Military-road, High-street.

From information collected on the spot, the quality is good; but during the season of scarcity last summer, the supply was intermittent, an evil which is proposed to be remedied by a Bill now before Parliament, to enable the Company to extend their works and increase their supply.

The Sandgate Waterworks derive their supply from two sources; viz. from the hill side at Shorncliff, near the extreme west end of the town, and from high ground near Castle Hole, as shown on the Map. At each of these points drains are cut into the hill, leading the water into two small covered reservoirs or tanks of brickwork, capable of containing 20,000 gallons each, or one day's supply. That at Castle Hole is 67 feet, and that at Shorncliff 83 feet above the High-street. These reservoirs appear to have been carefully built, and as the whole of that part of each of them containing water is below the level of the springs, they cannot be considered to leak, although there is reason to believe that when empty, springs break up through the bottom of each of them.

The character of these two sources of supply is somewhat peculiar, dependent upon the geological nature of the situation.

The upper part of the heights above Sandgate consists of part of the upper division of the lower green-sand; this is comparatively of an open sandy structure, admitting of the percolation of water freely. These beds repose on the middle division, a bed of a totally different mineralogical character, being a comparatively water-tight bed of an argillaceous character, extending to the level of the sea, and beneath the beach on which the town of Sandgate is built. This bed is comparatively destitute of springs, and the water derived for these works is due, for the most part, to percolation through the upper beds, stopped in its passage and thrown out on the upper surface of the middle beds; and this general character is marked along the whole coast line from Radnor Cliff, near Folkestone, to the west end of Sandgate, by the wet, marshy, and peaty spots, bearing the well-known rushes and other plants which require such habitats. The surface near the out-crop, too, has been generally very much disturbed, and long lines of slip, forming the undercliff parallel with the ridge on which the Martello Towers stand, may be traced through the line of the Shorncliff works.

Mr. Harman states, that the soil met with in the works at both these sites was a confused mass or "jumble" of sand and clay, silt and peat, without any apparent regularity of bed, such a state of things as may generally be met with at the back of slips.

The works of Shorncliff consist of a trench, varying from 12 to 20 feet deep, cut into such ground, and then partially filled with a bed of broken stone to act as a drain, the surface being restored by filling in and levelling the excavated material. The water is delivered near the top water level of the tank; the supply at present is 8,100 gallons per 24 hours.

The construction of the works at Castle Hole is almost the same, except that in this instance the drain bifurcates, a branch extending on each side of and about 15 feet below the level of the Castle Hole pond. The reservoir is of the same size, and the other arrangements are of the same character with those at Shorncliff; but in the cutting in this case a very considerable quantity of peat was met with, and the character of the soil, as ascertained by a trial shaft opened for me, varies so greatly and in such a manner, that the quality of the water must, in my opinion, necessarily vary in proportion as the water may be brought more or less in contact with particular soils, and according to weather; and this will account, to some extent, for some remarkable anomalies which different analyses have afforded to the chemists who examined them. The present supply of this system is 16,000 gallons per 24 hours.

The water yielded to these two tanks brings in a very fine sand, stated at various quantities, but at all events sufficient to render the water slightly turbid as it issues from the collecting drains; and if the draught is not rapid nor the water in the reservoirs very shallow, the water flows from the pipes almost clear, but slightly coloured with an oxide of iron. A careful examination of the deposit in the eastern tank and in a private cistern in the town supplied with the same water, indicates no important amount of organic matter; but there is reason to believe that there is a considerable destruction of the iron pipes now going on, attributed by some to an oxidation of the interior of the pipes while the water is turned off; by others, to the action of the water itself on the iron.

The sediments referred to differ materially, as, while the oxide of iron in that of the Castle Hole Reservoir amounts to 9¾, that of the cistern amounts to nearly 31 per cent.

The main pipes from these two reservoirs are connected, so that to a certain extent the waters are mixed in the town; but as that from Shorncliff is only about a third of the whole quantity, the western district may be considered as supplied from Shorncliff, while the great bulk of the houses in the middle district are supplied from the eastern or Castle Hole Reservoir.

Analysis of these Waters.

In consequence of the very unsettled state of opinion of many of the inhabitants as to the quality of the water, and considering it desirable thoroughly to investigate so important a matter, I have had analyses made of these waters as well as of some from wells in the town; these have been undertaken chemically by Mr. Herapath, of Bristol, and microscopically by Dr. F. Brittan and Mr. Etheridge, members of the Microscopic Society of Bristol; and the results of all these examinations, and their remarks on the comparative values of the samples, without knowledge of locality, are given in the Appendix.

Scarcity of Supply in 1854.

It appears that Sandgate was visited last year with the same scarcity of water as was felt throughout England. From the month of March the supply would not admit of being otherwise than intermittent, the water being turned off between 8 P. M. and 7 A. M., and during the summer and autumn months was very soon exhausted when turned on; one cause of which appears to have been a waste consequent on the natural aversion to use the turbid (described by some as "grouty" and "iron-mouldy") water first issuing from the pipes, and which was accordingly thrown away or turned into the drains. The quantity every day decreasing, it appears that at length scarcely any water flowed which was not more or less turbid and uninviting, and accordingly while some persons for drinking purposes began to filter it, others reverted to the wells (from which they drew their supply during the period of the cholera, and from which water is still drawn), although containing a high per-centage of foreign matter.

As such a lamentable failure in the system of water supply has already taken place, and as there are undoubted defects in the quality, which settling reservoirs or filters may or may not prove adequate to remove or modify, it would seem proper to consider if advantage cannot be taken of a very obvious remedy, by connecting the Sandgate water-pipes with those of Folkestone, now within the town.

Remarks.

Having thus stated such facts as I have been enabled to gather respecting the public and private drainage and water supply of Sandgate, it does not appear that we can trace in the defects of either, the sole and specific cause of the extreme virulence of the late attack of cholera.

It is found that the new works of sewerage in the middle district to which the ravages of the disease were mostly confined, are in an imperfect and obstructed state; but so also are those of the western district, laid down on the same system, and in which not a single case occurred; while in the district drained by the Folkestone Sewer, silted up as it was found to be, only a few isolated cases are recorded. We cannot, therefore, attribute the mortality which occurred as entirely due to proximity or connexion with the new works of drainage.

Again, referring to the abstract of the schedule of cases, we find, that while 29 fatal cases occurred on premises which had formerly contained cesspools, now more or less imperfectly filled up, there were 16 fatal cases on premises which, formerly using the "tub system," never had cesspools, and were, so far as their own premises extended, free from this influence.

An examination of the statistics of the water supply used in the various cases, induces still greater hesitation before attempting to fix upon this as the specific cause of the disease. I have no means of knowing the exact number of the inhabitants who drank of the different waters, but should think the proportion would be fairly represented by the cases of attack recorded; we then see death occurring alike to those who used water from the Sandgate or Folkestone Water-works only, as well as to those who eked out their short supply by drawing from wells and pumps, or to those who took their supply entirely from the latter source.

In conclusion, I am irresistibly led to believe, that while all the untoward circumstances referred to have had their influence in this sad mortality, yet that contamination of the air has been the principal ally of the epidemic. This great impurity in the central part of the town may possibly, in some measure, be accounted for thus: referring to the wall which was built by Lord Radnor to keep the sea water from percolating into the wells, and which extends along the front of this central part of the town, we must conclude, that in answering the purpose for which it was intended, it must, to a certain extent, have had the effect of preventing the escape of any superfluous water from within. Immediately under the shingle upon which this part of the town is built, lies a stratum of the lower green-sand to which the wells are sunk, and the effect of the numerous cesspools which were formerly in use here, must undoubtedly have been to saturate the shingle and the surface of the sand bed referred to. Since the operation of the new sewer works, in 1852, most of these cesspools have been filled up, but in the greater number of cases without the soil contained in them having been removed. The leakages which have been going on from the joints of the new sewers and house-drains, have, there is too much reason to fear, been daily contributing an additional supply to the same receptacle. Now, as is well known in the case of carburetted hydrogen in coal mines, a vast amount of fatal gas may remain dormant for a long time, until a slight fall in the atmospheric pressure developes it in all its force; is it not therefore probable that in the superstratum of coarse shingle a large volume of gaseous impurity may have lurked, until circumstances of temperature, variable atmospheric pressure, absence of wind, or other causes, may have called it forth to become, with the fatal cholera poison, the instrument of disease and death. Simultaneously the supply of water falls short in quantity, and the quality of a large proportion of that in use, there is too much reason to believe, must be considered as unfavourable to health at such a critical period.

An extract from the very able Report of Dr. Milroy, who was at Sandgate as Medical Inspector from the General Board of Health during a part of the time, expresses so clearly the condition of the atmosphere that then existed, that I cannot do better than quote it, as expressing the experience of those amongst whom I have pursued my inquiries: he says,—

> "The circumstances connected with the appearance and progress of the cholera in Sandgate are these: for the last week or two in August the weather was remarked to be singularly oppressive, not so much from any excess of thermometric heat, as from the close stagnant state of the atmosphere. The little wind that occasionally blew was from the east or north-east; an unusual quarter at that season of the year. Unpleasant smells were more than ordinarily nauseous, and meat was observed by the butchers to become tainted very quickly. Some vegetable crops had been destroyed by blight or insects, and I can testify, from my own feelings, to the oppressive closeness of the air during the six days that I remained in the village; there was none of the cool freshness we expect to find at the sea-side."

Briefly it may be stated, that the public and private drainage of Sandgate is, from defective construction, insufficient for the purposes required; that the escape of the liquid sewage and water necessary to its perfect action contaminates the soil; that the surface drainage and cleansing, although in some measure lately improved, are much neglected; that many of the cesspools formerly in use are still open, or only very imperfectly closed; that the private sources of water supply are in many cases polluted; and that the public water supply is liable to be very short in quantity, and not unexceptionable in quality.

I have, &c.

Bristol, 21 February 1855. *Thos. E. Blackwell.*

Appendix (A.)

TABLE, showing Particulars of FATAL CASES during the Outbreak of Cholera at *Sandgate* in the Year 1854.

No. of Case.	DATE.	NAME.	AGE.	RESIDENCE.	Source of Water Supply.	Whether, at the time of New Works, there were any Cesspools on Premises, and have they been filled up.	By what size Pipe is House Drain connected with Public Sewer, and is it Trapped, or otherwise.	Has Connecting Pipe ever been stopped.	OBSERVATIONS.
1	Aug. - 26	Mrs. S.	60	Barn-house	Sandgate Waterworks	2, both filled up	4-inch pipe syphon and pans	No.	
2	„ - 31	Miss W.	28	High-street	ditto	1, filled up	4-inch pipe syphon	No.	
3	„ - 31	Miss R.	28	Ditto	Folkestone Waterworks	None; tub	ditto - ditto	No.	
4	„ - 31	Mr. L.	60	Saunders Cottage	Sandgate Waterworks	ditto	ditto - ditto	Yes.	
5	„ - 31	— S.	5	Jenner's Cottage	ditto	ditto	ditto - ditto	No.	
6	Sept. - 1	— L.	14	ditto	ditto	ditto	ditto - ditto	No.	
7	„ - 1	Miss C.	25	Mount's Lodgings	Folkestone Waterworks	1, filled up	ditto - ditto	Yes.	
8	„ - 2	Mr. B.	60	Bateman's Cottage	Sandgate Waterworks	None; tub	ditto - ditto	No	Drank water from Mr. Marsh's well; drains all found stopped.
9	„ - 2	Miss W.	28	High-street	Sandgate Waterworks laid on, but drank well-water (E)	2; 1 filled up	ditto - ditto	No	Same well as in Case No. 17; drains stopped.
10	„ - 2	Mr. G.	54						
11	„ - 3	Mrs. G.	49						
12	„ - 4	Mrs. N.	Aged	Bellevue House	Sandgate Waterworks laid on, but drank well-water (E)	2; 1 filled up	ditto - ditto	No	Drains defective.
13	„ - 5	Miss N.	29	ditto	Sandgate Waterworks laid on, but drank well-water (E)	2; 1 filled up	ditto - ditto	No	Two children of this family died after removal from Sandgate.
14	„ - 5	Miss N.	58	Sea-view Cottage	Sandgate Waterworks and well	1, filled up	ditto - ditto	No	
15	„ - 6	Mrs. H.	27	Albion House	Sandgate Waterworks and well (D)	2, ditto	ditto - ditto	Yes.	
16	„ - 6	Mrs. J.	58	Beech Cottage	Sandgate Waterworks laid on (E), but drank well-water (E)	2; 1 filled up	ditto - ditto	Yes.	
17	„ - 6	Mr. A.	38	Surgery		2; 1 filled up	ditto - ditto	No.	
18	„ - 6	Mrs. W.	Aged	Sea-view Cottage		1, filled up	ditto - ditto	No.	
19	„ - 7	Miss A.	12	Surgery		2; 1 filled up	ditto - ditto	No.	
20	„ - 7	T. E.	60	Bateman's Cottage	Sandgate Waterworks	None; tub	ditto - ditto	No.	
21	„ - 8	Mrs. S.	35	Laker's Cottage	Folkestone Waterworks and well	2, not filled up	Not connected	-	Folkestone sewer opened here.

22	„	8	Mrs. H.	Aged	High-street	Sandgate Waterworks	None	4-inch pipe syphon	No.	
23	„	9	Mr. C.	36	Mount's Cottage	Folkestone Waterworks	1, filled up	ditto - ditto	Yes.	
24	„	10	Miss L.	24	Laker's Cottage	Folkestone Waterworks and well	2, not filled up	not connected	-	Folkestone Sewer opened here.
25	„	10	Mrs. W.	54	New Inn	Sandgate Waterworks and pump	2, filled up	4-inch pipe pan traps	No.	
26	„	10	-	25	Marine Parade House	Sandgate Waterworks and well (C)	2, ditto	4-inch pipe syphon and pan	Yes	Drainage found stopped.
27	„	10	Mr. K.	30	Back-lane	None	None	Not connected.		
28	„	10	Miss D.	16	Town's Cottage	Sandgate Waterworks	1, filled up	4-inch pipe syphon	Yes	Drainage found stopped in branch pipe.
29	„	11	Mr. C.	54	Martello-place	Folkestone Waterworks	1, not filled up	No connexion.		
30	„	12	Mrs. D.	54	High-street	Sandgate Waterworks	1, filled up	4-inch pipe syphon	No.	
31	„	13	Mr. B.	54	Marine Parade House	Sandgate Waterworks, but drank well-water	2, ditto	4-inch pipe syphon and square trap	Yes.	
32	„	15	Mrs. D.	54	Valyer's Cottages	Folkestone Waterworks	None; tub	4-inch pipe syphon	No.	
33	„	15	Mrs. B.	60	Reynolds Cottage	Sandgate Waterworks	ditto	ditto - ditto	No	Died at union.
34	„	16	Mrs. E.	60	High-street	ditto	None	ditto - ditto	No.	
35	„	16	— S.	3	Undercliff Cottages	ditto	ditto	ditto - ditto	No.	
36	„	17	Miss Q	50	High-street	Sandgate Waterworks, but drank well-water	1, filled up	ditto - ditto	No.	
37	„	18	Mrs. W.	54	Mr. Rae's shed	None	None	Not connected.		
38	„	18	Mr. S.	22	Joy's Cottages	Sandgate Waterworks and well	None; tub	4-inch pipe syphon	Yes.	
39	„	18	Mrs. N.	48	Valyer's Cottages	Folkestone Waterworks	ditto	ditto - ditto	No.	
40	„	19	Mrs. R.	60	High-street	Sandgate Waterworks and well	1, filled up	ditto - ditto	Yes.	
41	„	19	Mr. P.	52	Cliff House	Folkestone Waterworks and well	1, not filled up	ditto - pan-traps	No.	
42	„	20	Mr. F.	60	Fleur-de-Lis	Well	1; no information	Not connected.		
43	„	20	Mr. R.	75	High-street	Well (R)	1, filled up	4-inch pipe syphon	No	
44	„	20	Mrs. F.	37	Military-road	Sandgate Waterworks	None; tub	ditto - ditto	No.	
45	„	22	— H.	1¼	Devonshire-place	ditto	None	ditto - ditto	No.	
46	„	27	Mr. H.	26	Roberts Stables	None	None	Not connected.		
47	„	30	Mrs. M.	32	High-street	Sandgate Waterworks and well	None; tub	4-inch pipe syphon	No.	
48	„	30	Mr. R.	28	ditto	Well (R)	1, filled up	ditto - ditto	No.	

Appendix (B.)

TABLE, showing Particulars of NON-FATAL CASES during the Outbreak of CHOLERA at *Sandgate* in the Year 1854.

NAME.	AGE.	Description of Illness.	RESIDENCE.	Source of Water Supply.	Whether, at the time of New Works, there were any Cesspools on Premises, and have they been filled up.	By what size Pipe is House Drain connected with Public Sewer, and is it Trapped, or otherwise.	Has connecting Pipe ever been stopped.	OBSERVATIONS.
Mr. H.	45	C.	New Inn Tap	Sandgate Waterworks, and well	None; tub	4-inch pipe syphon	No.	
Mr. P.	48	C. D.	Town Cottages	Sandgate Waterworks	1, filled up	ditto - ditto	Yes.	
Mr. M.	40	C. D.	Sea-view Cottage	Sandgate Waterworks, and well	1, ditto	ditto - ditto	No.	
Mr. W.	22	C. D.	High-street	Well	1, ditto	ditto - ditto	No.	
Mr. P. Mr. P. Mr. P. Miss P.	52 50 22 25	C. D. C. D. C. D. C. D.	Albion Cottage	Sandgate Waterworks, and well	1, ditto	ditto - ditto	No.	
Mr. C. Mrs. C.	32 28	F. F.	Field's House	Folkestone Waterworks	None; tub	Not connected.		
Master B. Mr. H.	16 36 18	F. F. F.	Albion House	Sandgate Waterworks, and well for drinking	1, filled up	4-inch pipe syphon	Yes.	
Master S.	18	F.	Osborne Cottage	Sandgate Waterworks, and well	None; tub	ditto - ditto	No.	
Mr. F. Miss F.	52 23	C. D. C. D.	Collin's Cottage	Sandgate Waterworks	ditto	ditto - ditto	No.	
Mrs. J.	-	C. D.	-	-	-	-	-	No information; visitor.
Mrs. J.	42	C. D.	Ayre's Cottage	Well	ditto	4-inch pipe syphon	No.	
Mr. L. Mrs. L. Mrs. L.	-	C. D. C. D. C. D.	Higg's Cottage	Sandgate Waterworks, and well	ditto	ditto - ditto	No.	

82. Mrs. H.	60	C. D.	Rae's Houses	Sandgate Waterworks, and well for drinking	1, not filled up	ditto - ditto	No.	
Miss S.	50	C. D.						
Mrs. R.	70	C. D.	Rae's Houses	Well	1, filled up	ditto - ditto	No	Cesspool for surface drainage, and a tub still exist here.
Mr. R.	38	C. D.						
Mr. R.	28	C. D.						
Mr. R.	27	C. D.						
Mr. G.	38	C. D.	Rae's Cottage	ditto	None; tub	ditto - ditto	Yes.	
Mr. H.	68	C. D.	Rae's Houses	Well	None; tub	ditto - ditto	Yes.	
Mrs. J.	-	C. D.	-	-	-	-	-	Visitor; no information.
Mrs. M.	40	C. D.	High-street	Sandgate Waterworks, and well	None; tub	4-inch pipe syphon	No.	
Mrs. W.	62	D.	Flisher's Cottage	Folkestone Waterworks	ditto	ditto - ditto	No.	
Mrs. W.	60	D.						
Mr. R.	-	C. D.	High-street	ditto	ditto	ditto - ditto	Yes.	
Mr. W.	24	C. D.	Military Road	Sandgate Waterworks	ditto	ditto - ditto	Yes	These drains have been frequently stopped.
— M.	-	C. D.	-	-	-	-	-	Visitors; no information.
— M.	-	C. D.						
Mr. St. A.	-	C. D.	Martello-place	Folkestone Waterworks	None; tub	4-inch pipe syphon	No.	
Mrs. M.	-	C. D.	ditto	ditto	ditto	Not connected.		
— C.	-	C. D.	-	-	-	-	-	Visitor; no information.
Mrs. B.	26	C. D.	Cheriton-cliff Cottage	Sandgate Waterworks	None	4-inch pipe syphon	Yes.	
Mrs. F.	65	C. D.	Chapel-street	Well	1, not filled up	ditto - ditto	No.	
Mr. H.	58	C. D.	High-street	Sandgate Waterworks	1, filled up	ditto - ditto	Yes.	
Mr. O.	43	C. D.	New Inn	Sandgate Waterworks, and well	2, ditto	ditto pan traps	No.	
Mrs. H.	32	C. D.	Town's Cottages	Sandgate Waterworks	1, ditto	ditto - syphon	No information.	
Miss O.	34	C. D.	High-street	ditto	2, ditto	ditto - ditto	No.	

Note.—In this Table the ages are approximate.

Abbreviations—C. Cholera. C. D. Choleraic Diarrhœa. F. Fever. D. Diarrhœa.

Reference to Appendices (C.) and (D.)

SANDGATE INQUIRY.

DESCRIPTION of the various Waters and Earthy Deposits referred to by Letter in the Analyses by Mr. *Herapath* and by Messrs. *Brittan* and *Etheridge.*

"A"—FROM Bellevue House Well.
"B"—From a Tap of the Waterworks Water.
"C"—Water from Mr. Ballard's Well, Marine Parade House.
"D"—Mr. Hill's Well.
"E"—From Mr. Aldis's Well.
"F"—From Mr. Rea's Well.
"G"—From Tap of Waterworks, duplicate of "B."
"P"—From Reservoir at Shorncliff.
"Q"—From Reservoir at Castle Hole.
"S"—From Tap of Folkestone Waterworks in Sandgate.
"T"—From Spring supplying Castle Hole Pond.
"Z"—From the Pond at Castle Hole.
"H"—Deposit from the Reservoir, Castle Hole.
"I"—Deposit from Cistern supplied with Waterworks Water at Bellevue House.
"X"—Duplicate of "P".
"Y"—Duplicate of "Q".
"Castle"—Deposit from Castle Hole Reservoir.
"Bellevue"—Deposit in Cistern, Bellevue.

Appendix (C.)

To *T. E. Blackwell*, Esq.

Sir, Bristol, 29 January 1855.

I FORWARD the results of the analysis of seven of the waters ticketed as below: in each case the figures are grains and decimal parts in an Imperial gallon:

	"A"	"B"	"C"	"D"	"X"	"Y"	"Z"
Chloride of magnesium	·32	·32	trace	trace	trace	trace	trace.
Organic and nitric acids of salts	2·00	1·60	3·20	2·56	1·60	1·92	2·52
Common salt	12·08	5·92	12·00	6·72	5·60	4·48	4·16
Sulphate of soda or magnesia	1·12	trace	·48	·80	·96	trace	trace.
Carbonate of lime and magnesia	3·52	2·52	9·76	8·96	2·08	4·32	4·00
Organic matters of earths	3·68	3·10	3·68	3·52	1·60	3·20	3·52
Sulphate of lime Silica Trace of iron	7·64	4·80	12·64	7·04	4·32	5·92	4·00
TOTAL Solids	30·36	18·26	41·76	29·60	16·16	19·84	18·20
Ammonia, free per gallon	.072	0·60	none	·145	none	·048	*·1694
Nitric acid of salt	·900	·95	none	·900	trace	·250	·8500
Conferva deposited	yes	yes	none	very little	none	yes	none.
Oxide of iron, well deposit	2·88	3·20	1·28	1·60	none	·800	none.
Entire organic matters	4·68	3·75	6·58	6·08	2·3	4·00	6·04

* Animalcules, sulph. hyd.

The general character of these waters is not much varied. They are evidently from a vegetable source; that which is most free from organic matters has $2\frac{3}{10}$ grains per gallon, and the worst has $6\frac{1}{2}$ grains: part of this is, in each case, in the state of an organic acid, united with magnesia or lime, and another portion is what has been called "extractive" or apothem, being insoluble after having been dried. This form of organic matter exists in water from peat bogs. The only water I can trace sewage in is "Z." This contains traces of hydrosulphuric acid, and its ammonia is in larger proportion than either of the others, one-sixth of a grain per gallon: it also contains a very large number of animalcules. The only water containing sediment worth noticing was " B.;" this might be from the sediment having fallen in the jars from which they were decanted. The solids in solution vary from $16\frac{1}{6}$ grains in " X" to $41\frac{3}{4}$ in " C." The other components will speak for themselves. It will be seen that " A," " B," " D," " Y" and " Z," contain free ammonia, and also nitrates, which generally arise from the oxidation of ammonia in the free or potential state; and I wish to call attention to lines three and four of the second Table by " conferva deposited." That upon introducing a piece of bright iron into a bottle quite full of the water, corking it closely, in five or six hours the iron becomes coated with a layer of bright green conferva, and in a few days a red deposit, or oxide of iron, falls to the bottom. The first appearance is witnessed with " A," " B," " D" and " Y," and shows the vegetable origin of the water, and the red deposit shows what will be the action of the water in choking up the iron service-pipes. This effect is seen in " A," " B," " C," " D" and " Y." In some towns this has already given great trouble and expense. The judgment I give upon the present samples is, that none of them are fit for the supply of a town but " X," which there would be no objection to.

ANALYSIS of Two Sediments.

	CASTLE.	BELLEVUE.
Water	3·54	4·67
Organic matters, with some carbonic acid	·43	·49
Oxide of iron, with some alumina	9·76	30·92
Carbonate of lime	1·36	1·40
Carbonate of magnesia	traces	traces.
Sulphate of lime	traces	traces.
Lead	- - -	trace.
Sand, silica and silt	84·91	62·52
	100·	100·

I do not think that either of these has been in a state of solution in the water, except perhaps part of the oxide of iron in that marked Bellevue. The remainder seems to be principally silt, which has been in suspension only, and fell upon the water remaining at rest. I forgot to say, when speaking of the waters, that I think the little iron which was found in them was in the state of phosphate.

I remain, &c.
(signed) *William Herapath*, F. C. S., C. M. E. S.

To *T. E. Blackwell*, Esq.

Dear Sir, Bristol, 12 February 1855.

I forward the enclosed, as you were anxious to have a report upon the waters marked " P" and " Q," which I have completed the analysis of, except the iron deposit of " Q," which is going on:

	" P"	" Q"
Chloride magnesium	trace	trace.
Organic acid and nitric acid of nitrates	3·20	2·40
Common salt	4·80	3·68
Sulphate magnesia	trace	trace.
Organic matter as extractive	2·56	2·40
Corbonate of lime	4·64	3·00
Sulphate of lime	1·28	5·60
Silica	·16	·60
Iron as phosphate	trace	trace.
TOTAL	16·64	17·68
Ammonia, free	·011	·06
Nitric acid combined	·402	·58
Deposit of conferva	some	more.
Deposit of oxide of iron	1·600	2·88
Entire organic matter	5·760	4·80

Both these waters are of the same character as the last; but both, like "Z," contain living animalcules, and, on standing, allow a slight deposit to fall of a slimy character, no doubt produced by those animalcules.

I remain, &c.
(signed) *William Herapath*, F. C. S., C. M. E. S.

To *T. E. Blackwell*, Esq.

Dear Sir, Bristol, 19 February 1855.

I HAND you now the results of the analysis of the two remaining waters, marked "S" and "T".

	"S"	"T"
Chloride of magnesium	·20	1·12
Organic acid and nitric acid of nitrates	1·60	1·92
Common salt	2·50	7·68
Sulphates of soda and magnesia	trace	trace.
Organic matter as extractive	1·92	3·68
Carbonate of lime	7·52	11·20
Sulphate of lime	3·92	3·54
Silica	trace	·10
Oxide of iron	trace	trace.
TOTAL Grains	17·68	29·24
Ammonia, free, per gallon	0	0
Nitric acid of salts	·26	·54
Conferva	some	some.
Oxide of iron deposited on iron	2·88	3·04
Entire organic matters	3·52	5·60

In taking in review the 11 samples of water as for the supply of a town, I throw out of consideration Y and Z, as they contain living animalcules, and, as such, unfit for the purpose. I have placed all of the 11 in series under four qualities important to be considered. Under these heads they stand in order, as follows:—

1st. Quantity of solid contents per gallon: best, X, P, Q, S, B, T, D, A, C, worst.
2d. Hardness; quantity of soap destroyed: least, P, X, B, Q, A, S, T, D, C.
3d. Quantity of organic matter per gallon: least, X, S, B, Q, T, A, P, D, C.
4th. Deposit in iron service-pipes: X, Q, C, P, D, A, S, B.

It will be seen that X stands best in three out of the four series, and stands second in the other, therefore that is the best water. If there should not be a sufficient supply of this, then I should take S as the next in order for general purposes, making the service-pipes a little larger. The next would be P. I presume these three would give a sufficient choice; if not, the series must be consulted to find another. It will be seen that most of these waters have a common stamp; they contain much organic matter, as salts and as extractive; they are not "hard" comparatively with the generality of towns, and are softer than those of Bristol. They contain traces of free ammonia, except C, X, S and T, and nitrates in small proportion; and all, except X and Z, will allow a deposit of red oxide in the service-pipes. C will be out of view from its comparative hardness, unless some very great advantages in a point of view unseen by me should create a preference for it.

I remain, &c.
(signed) *William Herapath*, F.C.S., C.M.E.S.

Appendix (D.)

To *T. E. Blackwell*, Esq.

Sir, Bristol, 19 February 1855.

IN compliance with your request, we have submitted to careful microscopic analysis the several samples of water forwarded for our examination, and beg to submit for your information the following results.

As we find that these waters respectively contain many objects common to water generally, but nothing in itself specially or peculiarly characteristic, we think we shall best comply with your wishes, and be enabled to afford the greatest amount of information respecting them, by combining with the detailed result of the examinations a few particulars respecting the natural habits and usual localities of the organisms met with—from the consideration of which certain inferences may be drawn as to the qualities and sources of the samples in which they have been found.

WATER marked E.

The microscopic analysis of this water has yielded a considerable amount of animal and vegetable life. In arranging the details of the examination we have adopted the plan of rendering a complete list of contents, arranged according to their position, and divisions in the animal and vegetable kingdoms; and have also stated the peculiar character and condition of the water in which such animals and plants usually exist.

ANIMALS.

Class *Crustacea*.—Division *Entomostraca*.

Chirocephalus diaphanus.—This, the fresh-water shrimp, is usually found in stagnant or slowly-running water, either in ditches or ponds fed by tributary streamlets.

Their food consists chiefly of dead animal and vegetable remains.

Those observed in this water measured full ¼ of an inch in length.

Daphnia pulex (Water Flea).—These small crustaceans are found in almost every stagnant pool or ditch, at all times of the year; they exist in horse-ponds, and pools rich in vegetation yield them abundantly.

INFUSORIA.

In this sample there are eight species of animalculæ, all more or less inhabiting (in their usual state) waters which must of necessity hold in solution animal and vegetable matter, such as are chiefly found in pools and ditches.

Monas crepusculum.—These animalculæ, from their extreme minuteness, may be present in large numbers in many kinds of water; they exist chiefly in water holding in solution, or in flocculent masses, much animal and vegetable debris, and fungoid bodies.

Monas punctum.—Found usually in vegetable infusions, and frequently in bogs, or bog water; there are several in this sample.

Glenomorum tingens.—These animalcules are generally found in and confined to stagnant water, associated with Lemnæ and Confervæ: many clusters were found in the water under analysis.

Vorticella convallaria.—This animalcule is abundantly found in the waters of all standing pools or ponds, attached to vegetable substances contained therein. They are almost constantly to be met with on the submerged stems of bog plants. These vorticellæ were very abundant in the sample of water contained in the bottle marked E, under examination.

Tracheleus anas.—The Trachelina exist chiefly amongst confervæ and vegetable infusions partly decomposed, and are found in water in most exposed situations, containing an abundance of Algæ.

Amphileptus anser.—The Amphilepti are inhabitants of slowly-running water, ditches or reens, in alluvial or flat lowlands; they abound amongst aquatic plants and dead or decomposing sedge leaves; several of these animalcules were found amongst the ferruginous vegetable remains in this sample of water, which have much the appearance of decomposed bog plants.

Euplotes charon.—Found only, or generally, in stagnant animal and vegetable infusions, and usually of the worst or most impure description. There were a considerable number in this sample of water. This animalcule abounds in vessels or tanks that have stood some time, and have become offensive to taste and smell.

ANNELIDA. *Vibrio anguillula glutinis* (Müll.).—This being is most abundant also in stagnant infusions; several were found in this sample, and are visible to the unassisted eye. They occur abundantly in ponds abounding in disintegrated organisms.

PLANTS.

The plants existing in this sample of water belong to the division Algæ or Confervacæ; those present were entirely microscopic, and their source would appear to be open ponds, or semi-stagnant pools or ditches, or stagnant water, under almost any circumstances; those examined belong to that division of the Algæ usually associated with and under such conditions.

Oscillatoria.—This minute plant is abundant in this sample of water, associated with other contents, decomposing vegetable infusions, and more or less forms the nidus or resort for the infusoria. This plant, or family of plants, seldom exists in wholesome drinking water, but is invariably found in fœtid and stagnant pools (frequently in sewage water), and is common in still ponds possessing a clayey bottom.

Nostoc.—Specimens of this prolific genus of minute Algæ were present in the water under examination, although not at all abundant.

WATER marked F.

This sample of water afforded more animal life than that marked E, although many species were common to both. The vegetable infusions and remains, especially the tissues of plants, also far exceeds in variety and quantity sample (E); but on the whole, much similarity will be found to exist, as far as regards the Infusoriæ and Algæ.

ANIMALS.

Class *Zoophyta.—Hydra Viridis.*—Strictly an inhabitant of ponds and still waters, and then only when a considerable per-centage of living organisms exist, such as Entomostraca, Annelida, Infusoria and larvæ of the insecta, upon all of which they freely prey, the Entomostraca and Annelida being perhaps their chief food. They require water of a stagnant or semi-stagnant character.

Insecta.—Remains of insects, such as the Elytra of Coleoptera (Nepa), larvæ of the gnat, head of the " Notonecta," a coleopterous insect.

These are not generally found in freely running spring-water, and imply a constant habitation for their development.

INFUSORIA.

This water yields a large amount of infusorial life, and especially so for the quantity submitted for examination, not only in number as regards per-centage of life, but variety of species, and all of them inhabitants of impure water; without exception, the organisms found, upon microscopic analysis, are such as would be detected in waters yielding a considerable amount of decomposing vegetable and animal substances, which are necessary for their existence.

Monas crepusculum.—In considerable numbers, living amongst the decomposing vegetable matter and fresh algæ which this sample contains. The remarks upon this animalcule in sample E will apply here.

Monas lens.—Abundant amongst the animal and vegetable debris contained in this water.

Vorticella convallaria.—This parasitic animalcule is abundant on the comminuted remains of the insects and plants contained in this water.

Most of the Vorticellæ inhabit swampy water, containing animal or vegetable matter, which they require as food; standing pools and old ponds yield them in abundance.

Stylonchia lanceolata.—The Oxytrichinæ, to which these animalcules belong, are without exception inhabitants of water containing animal or vegetable matter in a state of decomposition. They are frequent in ditches near towns, and in sewage; they also occur in marine, bog, brackish and stagnant waters.

Oxytrichia gibba.—The above will apply to this animalcule also; several were found.

Euplotes charon.—The Euplota also are found only in water which is favourable to the development of the lower plants and algæ, and are more frequent in water undergoing decomposition, and of a stagnant nature, than any other; this species, E. charon, we find in almost all stagnant waters in the neighbourhood of Bristol.

Kolpoda cucullus.—Several in the water under analysis; abundant in most waters containing vegetable infusions; we find its congener, " Amphileptus anser," in sample water E.

PLANTS.

In this sample of water decomposing vegetable remains are abundant, and appear to have remained under maceration some lengthened period; scalariform tissue, epidermal appendages, hairs of plants, portions of siliceous coverings of the gramineæ or cereal plants, and bundles of cellular tissue; also entire minute Algæ, belonging to the divisions and genera Oscillatoria and Nostoc: these two latter plants occur on damp ground, or moist earth, or in standing waters containing animal and vegetable matter in a state of decomposition.

This is almost the first plant developed on such substances in the incipient state of decomposition.

Oscillatoria; *Nostoc.*—The remarks appended to these plants in sample E will also apply here.

WATER marked G.

This sample of water contained a great quantity of ferruginous peat-like vegetation, bearing evidence of long-continued water action, being very fragmentary and flocculent, in which condition it was the nidus for the numerous monads or minute infusoria which abounded in this water.

The little plant Oscillatoria was also abundant amongst the ferruginous peaty matter; and with this exception, nothing organic of importance was discovered in this water.

A considerable quantity of non-organic contents in the form of finely rolled and water-worn, brown and white highly ferruginous quartz, finely comminuted, existed as a sediment in this sample G.

SAMPLE H.—SEDIMENT.

This sample of mud, or sediment, upon reduction and examination, was found to consist entirely of quartzose sand, or debris, and a finely comminuted argillaceous or clayey element, unctuous, yet gritty to the touch. No organic remains whatever could be detected in this sample. From the quantity of sandy debris and finely comminuted clayey matter, we should infer that this sediment must arise from water having flowed through a district composed almost entirely of a quartzose or siliceous character, or sandy formation; the character of the sand would not imply that it was recent marine, the particles being highly coloured with the oxide of iron; in some cases dark green or brown. This deposit precisely resembles that of certain waters from the "Upper Green Sand" district of Warminster examined some time ago, and the clayey condition that of its associated chalk marl or gault.

The most patient and careful examination failed to detect organic remains in any form.

SAMPLE I.—SEDIMENT.

This sediment, also, upon the closest examination, produced no organic remains whatever, being composed entirely of very finely comminuted, highly ferruginous and water-worn quartz, having much oxide of iron held in suspension, resembling rust. This oxide was of that finely divided character, rather resembling a concentrated solution than a deposit, which we find resulting from atmospheric oxidation of wrought iron; and water flowing through a quartzose formation, and iron pipes in a state of oxidation, would produce the above results.

WATER E. contains

Animals:—Class Crustacea—Chirocephalus diaphanus.
  Daphnia pulex.
 Infusoria —Infusorial animalcules.
  Monas crepusculum.
  „ punctum.
  Glenomorum tingens.
  Vorticella convallaria.
  Tracheleus anas.
  Amphileptus anser.
  Euplotes charon.
 Annelida —Vibrio anguillula glutinis.
Plants - - - - - - Oscillatoria.
  Nostoc.
  Much uncertain vegetable matter in solution, such as cellular tissue, epidermal appendages, &c.

WATER F. contains

Animals:—Class Zoophyta—Hydra viridis.
 Insecta —Remains of insects, Elytra of coleoptera "nepa."
  Head „ "notonecta."
  Larvæ of gnat.
 Infusoria —Monas crepusculum.
  „ lens.
  Vorticella convallaria.
  Stylonchia lanceolata.
  Oxytrichina gibba.
  Euplotes charon.
  Kolpoda cucullus.
Plants - - - - - - Oscillatoria.
  Much decomposing vegetable matter occurs in this sample - - {Tissues of plants. Epidermal appendages. Scalariform vessels. Siliceous portions of the gramineæ. Cellular tissue.}

WATER G. contains

Animals:—Infusoria—Monas crepusculum.
  „ punctum.
Plants: — Nostoc —A considerable quantity of vegetable matter, resembling bog and peaty plants, very ferruginous, resembling bog iron, exists in this sample, the nostocs and monads abounding intermixed with the vegetable infusions.
Non-organic matter —Brown and white quartzose sand, much water-worn, having the appearance of ferruginous quartz disintegrated: water constantly flowing through ancient marine sand, or sandy beds, or over a sandy or siliceous rock, would readily afford the condition exhibited in the sample G.

SAMPLE H.—SEDIMENT.

Little or no organic remains.—*See* detailed result.

SAMPLE I.—SEDIMENT.

No organic remains whatever.—For remarks, *see* details.

In conclusion. These waters, containing, as we have before stated, nothing of special or peculiar character that is appreciable by the microscope, we can afford no more positive information than may be deduced as inferences from the above particulars. These we would suggest are as follows; viz.

1. From the fact of living animal and vegetable organisms existing in quantity in each sample, we should expect that they would contain much organic matter in a state of disintegration and decomposition, as in fact microscopic examinations showed to be the case.

2. From the characters of the organisms found, and their known peculiarities as to habitat, and food, &c., we should consider such organic decomposing matter to exist in largest proportion in samples F and E.

3. In regard to the source of the waters, we should suppose them to have been obtained from limited bodies of stagnant water, communicating with the air, or with ponds, or water more or less stagnant. The latter inference is rendered most probable by the absence, in any quantity, of the debris of organic substances of larger size; for instance, the leaves or remains of decayed vegetable and animal tissues of higher organisms.

4. In regard to the origin and nature of the organic matter contained in the waters, probably the best means of forming an opinion would be afforded by the consideration of the conditions and circumstances affecting the sources from which they were obtained; part of it, however, it must be borne in mind, must be due to the decomposition of the animal and vegetable inhabitants themselves. But it must be remembered, also, that organic matter, in its decomposed state, may exist in water in a form and condition unappreciable by the microscope, although in quantity and quality calculated to render it most prejudicial as a predisposing agent to disease when used for domestic purposes; and in the absence of chemical analysis to determine its exact nature and amount, and of a knowledge of the character of their sources, we can only refer to the particulars given in the detailed examinations, and to the above inferences, as evidence bearing upon the question of the fitness of these samples, or rather upon the extent of their general impurity.

We are, &c.

Fred. Brittan, M.D., &c.,
Lecturer on Physiology and on Microscopic Anatomy,
Bristol Med. School.

Robert Etheridge, F.G.S., &c.,
Lecturer on Vegetable Physiology and Botany,
Bristol Medical School; Curator to the Museum
of Natural History, Bristol Literary and Philosophical Institution.

Appendix (E).

SANDGATE IMPROVEMENT WORKS.

Gentlemen,

In accordance with your instructions, I proceeded to Sandgate, to take up and relay that portion of the main drains which had been found to act inefficiently, and I now beg to report to you thereon.

1. Main drain, 12 inches diameter, from outfall through the New Inn yard to junction in main street. Length, 230 feet; gradient, 1 in 240. Relaid. Found the outfall fixed too high by 7¼ inches, according to the section, which would admit of an inclination of 1 in 540 only, instead of 1 in 240.

In this portion many pipes were broken, and in one place seven in succession; these seven had a deflection of 1½ inch, with a little deposit found in the bottom. Between the houses leading from the New Inn yard, the pipes were found to contain shingle, several of them to the depth of six inches, and one to a depth of eight inches. Between the houses and the junction in the main street, much soil was found in a liquid state; two junction pieces, unconnected with the houses, had been stopped with straw, which was then in a rotten state.

2. Nine-inch main drain, running westward from the junction with the 12-inch main through the street, as far as the "Marine Hotel." Length, 860 feet; gradient, 1 in 320.

This line of pipes was most irregularly laid. In front of the New Inn, the pipes were two inches too low, with that quantity of soil in the bottom. From Mr. Jenner's to the Baths, the pipes were from 4 inches to 7½ inches too high, and were found clean. From the Baths to Belmont-house, the fall was reverse to the outlet, to the extent of 12½ inches, with the pipes quite full of soil. The shingle here was discoloured by the soil finding its way through the joints of the pipes. At Mr. Clarke's, the pipes were found correct, and perfectly clean. At Mr. Pledge's, they were 10 inches too low, having a deposit of about 6 inches, in a semi-fluid state. At about 30 feet from the upper end, they were again correct and clean. Several unconnected junction pieces were found to have been stopped with straw, then in a state of decay.

3. Nine-inch main drain running eastward from the 12-inch main to the small stream of water forming the boundary of Cheriton parish. Length, 670 feet; gradient, 1 in 240.

The pipes, as far as Mr. Colman's, were laid at their proper levels; but soil was found in them, varying from 1 to 3 inches, in which was some sand and horse-dung. This deposit would be accounted for by the breach found in the 12-inch pipe. From Mr. Coleman's, the pipes rose until, at Mr. Ballard's, they were found 10 inches too high. In this portion the soil varied from 1 to 4 inches in depth, amongst which were found rags, clothes, a stocking, and some sand. From the last point to the small stream they fell to within two inches of their proper level, and were found to contain 7 or 8 inches of soil, in a semi-fluid state. I found in this portion a blade-bone of a shoulder of mutton, a scrubbing-brush, and a little shingle. The unconnected junction pieces had been stopped with straw, and one had no stopping whatever.

4. (Western detached portion.) Nine-inch main drain, divided into two portions, east and west of outfall.

East portion, being from outfall to Mr. Dawkin's Lodge. Length, 600 feet; gradient 1 in 240. (400 feet of this line was relaid.)

The first 200 feet was found perfectly clean. At about 350 feet the pipes were 10 inches too low, having a fall reverse to the outlet. The deposit consisted of soil and sand; in one place it was six inches in depth. At the end, the pipes were found at their proper level. To the extent of about 100 feet in length from the end, the pipes contained about three inches of road sand, in a hard compact form, evidently carried into the pipe by floods from Mr. Dawkin's private road.

West portion. Length, 1,000 feet; none of which were relaid.

At about every 100 feet I opened the pipes and found them clean, with the exception of about 200 feet. This 200 feet was found to have a deposit of about three inches, chiefly of sand, and was removed by the means of long rods, and the hose and hydrant; at two places I found the pipes without any clay at the joints, with the water making a rapid escape into the shingle beneath.

5. Six-inch branch mains.

A. First street to the right, leading from the New Inn towards the small stream mentioned above.

At a point near the entrance into the main street, the pipes were found completely stopped with shingle, requiring a little force to dislodge it after the pipe was placed on end. Some straw, in a rotten state, was found behind the shingle. My opinion is, that this must have been done by design. Behind the stoppage, the pipes were quite full of soil. The pipes were thoroughly cleaned by means of the hose and hydrant.

B. Found completely stopped with rags, rope, yarn, hair and soil; cleansed by means of the rods and hose.

C. Acting freely, and clean.

D. Found completely stopped, rags and hair being the chief cause; the pipes were full of soil in a semi-fluid state; cleansed by means of rods and hose.

E. Back-lane. Water passed freely through this length, and in a short time was clean.

F. Chapel-street. Flushed with water, which soon was clean.

N. B.—The Surveyor reports, that about a month since he opened the main near the middle, to join a house drain, and then found the pipes quite clean.

SUMMARY:

Length of pipe relaid - - - - - -	2,160 feet.
„ examined and flushed - - - - -	2,840 „
Number of flush pipes put in - - - - -	23.

REMARKS.—In general, the house-drains connected with the main are joined in an improper manner (many junctions are effected at the top instead of the sides).

In the portions not relaid, there is reason to believe that many junction pieces still remain, as originally stopped with straw.

Substances have been admitted through the traps to the house-drains which are calculated to impede the efficient action of the mains.

All new junction pieces that are unconnected with the house-drains, as well as the flush pipes, are stopped with wooden plugs, 2½ inches thick, and clayed round to keep them firm.

They are marked upon the plan, and their position was pointed out to the Surveyor at the time.

During the progress of these works of reparation, I have received from Mr. Harman, the Surveyor, willing information upon matters connected with my visit.

I am, &c.
20 January 1853. (signed) *A. Rowe.*

Messrs. Rammell & Lister,
4, Trafalgar-square, London.

Appendix (F.)

Sandgate Enquiry.

Statement of Lengths, Diameters and Gradients of Public Main and Branch Collecting Sewers, taken from Contract Plans and Sections.

Western System.

Name of Sewer.	Diameter.	Length.	Gradient.	
			One in	
Main - - - -	6-inch	337 feet	263	N.B.—Pipe sewer, 2 branches not executed, 1 in 6 and 1 in 20, and 1 in 11·44, 360 feet long.
	6 „	175 „	240	
	9 „	925 „	263 and 240	
Middle System.				
Cross drain to tank - -	12-inch	230 feet	240	
Main, west - - -	9 „	880 „	320	
Main, east - - -	9 „	1,430 „	16 to 240	
West main - - -	6 „	84 „	320	
East main - - -	6 „	320 „	14·48	
Branch (Chapel-street) -	6 „	790 „	240 to 5·72	
Back Lane - - -	6 „	525 „	24 to 240	
Bateman's opening - -	6 „	155 „	120	Part relaid at 1 in 70.
Flesher's „ - -	6 „	150 „	120	
Quested's „ - -	6 „	150 „	120	
Town's „ - -	6 „	165 „	120	Part altered to 70.

ABSTRACT—Total Quantities.

	Feet.	*Feet.*	*Feet.*
6-inch - - -	west 512 east 2,339		
		2,851	
9-inch - - -	west 925 east 2,310		
		3,235	
12-inch - - - - -		230	6,316
Cast-iron 6-inch outfall pipes - -		- -	430
Sewers not executed - - -		- -	360

Appendix (G.)

To the Local Board of Health of *Sandgate.*

Gentlemen, Biggin-street, Dover, 17 May 1853.

I beg to hand you, on the fly-leaf, my account for labour and materials supplied to the works in your town, and shall feel obliged by the payment of the same.

I am, &c.
(signed) *Philip Stiff.*

The Local Board of Health of *Sandgate* to *Philip Stiff.*

Drs.

1852 :		To labour supplied to the order of Messrs. Rammell and Lister, your Surveyors, in the examination, alteration and improvement of drainage and sewage pipes.	*£.*	*s.*	*d.*
December	11	To amount of wages paid this day - - - -	3	13	10
„	18	Ditto - - - ditto - - - - - -	10	4	–
„	25	Ditto - - - ditto - - - - - -	9	17	8½
„	31	Ditto - - - ditto - - - - - -	11	9	6½
1853 :					
January	8	Ditto - - - ditto - - - - - -	16	–	4
„	15	Ditto - - - ditto - - - - - -	9	3	6
„	18	Ditto - - - ditto - - - - - -	3	9	9
		80 feet run of 12-inch glazed earthen drain pipes, 1 *s.* 8 *d.*	6	13	4
			70	12	–
		Add 10 per cent. for superintendence - - -	7	1	3
		£.	77	13	3

Appendix (H.)

Gentlemen, Board of Health Office, Sandgate, 20 December 1854.

In obedience to your instructions generally for flushing the "mains and branch sewers" of the Board, I commenced that operation upon them on the 27th ultimo, with varied success. My first experiment was with the main section, from Mr. Morris's gate to the Brewery Lane Outfall. I emptied a large body of water into it at that point which appeared to be discharged into the sea, but I regret that I could not test its action by the discharge of sewage matter. I am in doubt, therefore, whether it is perfect, and free of deposit. I examined also the working of the other section converging to the same point, commencing at Cheriton Cliff, which acted in the usual way, driving into the sea an accumulation of matter in the usual time. Subsequently to this, a complaint reached me of the offensiveness of the drains at "Ivy Cottage," which led me to examine it at that point. I inserted into it a quantity of water at "Thompson's Gate," which must have passed into the shingle, as so little flowed into the opening at "Ivy Cottage," no soil or other substance whatever was mixed with the water. I am of opinion, therefore, that that part of the section of "main sewer" is seriously defective.

On the 2d instant, I directed attention to the working of the branch mains of the eastern part of the works, and in consequence of the recent outbreak of disease in that locality, I was led to make a close and rigid examination of their condition, and the result has proved that flushing is no accurate test. I have more particularly to report that the state of the branch main at "Town's Opening" was such as to have damaged seriously the health of the town. On attempting to flush this branch, I found that it contained a quantity of deposit. On opening it up at the stop end, towards the cottages, it was charged with a concreted deposit the entire length of the frontage of these buildings. The shingle also had extended a considerable distance into it, through a junction left insecure during the execution of the works, causing an effectual stoppage; and, on further extending the opening, I discovered a half socket pipe inserted the reverse way.

In pursuance of your instructions, I have relaid the greater part of this branch, at an average inclination of 1 in 55. I have inserted a straight junction about the centre of the branch, which will facilitate examining its state, as also its action when flushed.

I would mention that the levels of this branch were so varied as to render it impossible to act.

I am, &c.
The Local Board of Health. (signed) *H. Pledge,*
Surveyor.

Gentlemen, Board Office, Sandgate, 27 December 1854.

Since your last meeting, I have completed my examination of the branch sewer at Pain's Opening. On opening it up from the stop end to Messrs. Ovenden and Brissenden's Forge, towards the street, I found (as in the case at Town's Opening) the lowest possible gradients alternately reverse nearly the whole length of the opening, and a deposit of liquid and solid matter, with a quantity of shingle collected in it, at a point between Bateman's and Grimwood's junction, which it is not easy to account for. I have examined and cleared a greater length than I found it practicable to take up and relay; but I regret to add, that it will be necessary to open it up at a point nearer the street, to clear it of an apparently slight obstruction.

That portion which was taken up I have relaid at an average inclination of 1 in 70. I regret that the nature of the ground would not permit of a higher gradient. I have inserted a straight junction, with an eye nearly to the surface of the ground, which will afford a facility of examining it, and also for testing the effect of flushing in the ordinary manner.

I beg again to direct your attention to the " main sewer," forming the western section, commencing from Mr. Thompson's gate, which is very unsatisfactory in its action. It appears to me also of the greatest importance that you should direct an examination of the remaining side drains, and the main at the back of " Reynolds" lane.

I would again mention, that it would be most convenient as well as desirable for you to determine on the plan and extent for ventilating the sewers during an examination of them. I have addressed a letter to Mr. Coleman for permission to construct a shaft against the south-western corner of his house; should his consent be given, if desired, I will make similar applications.

With reference to the cause of the peculiar localization of the late epidemic cholera near to the sewage chamber, I have been informed that the old cesspools to " Bellevue House " and Mr. George's are still in existence on these premises. It will be found necessary to examine each property in that locality, in order to discover these hidden evils, and thereby restore that part of the district to health.

I am, &c.

(signed) *H. Pledge,*

The Local Board of Health. Surveyor.

PLAN No 1

SANDGATE INQUIRY.

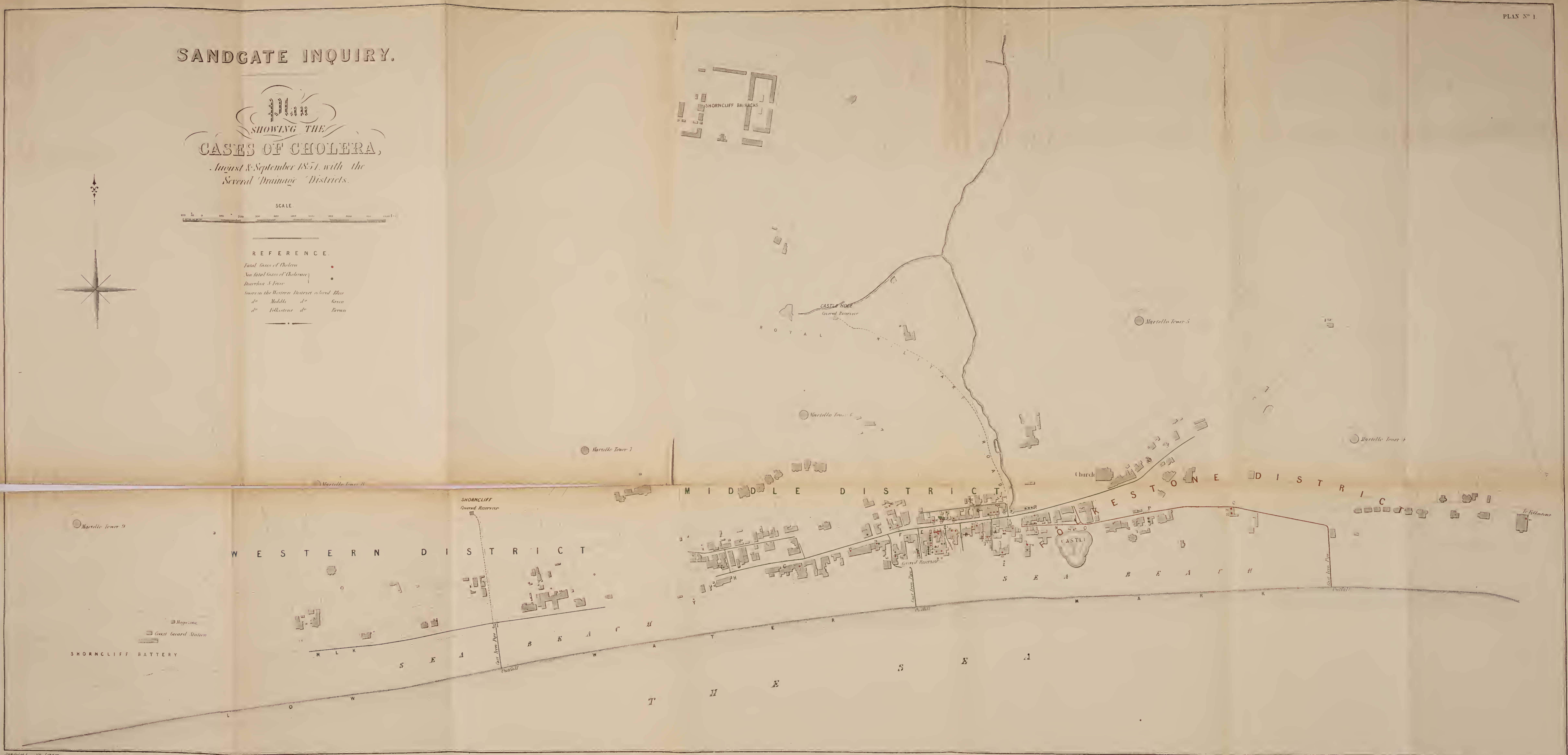
Plan
showing the
CASES OF CHOLERA,
August & September 1854, with the Several Drainage Districts.

SCALE.

REFERENCE.

Fatal Cases of Cholera	🟥 ●
Non fatal Cases of Cholerine / Diarrhœa & Fever	●

Sewers in the Western District colored Blue
do Middle do Green
do Folkestone do Brown



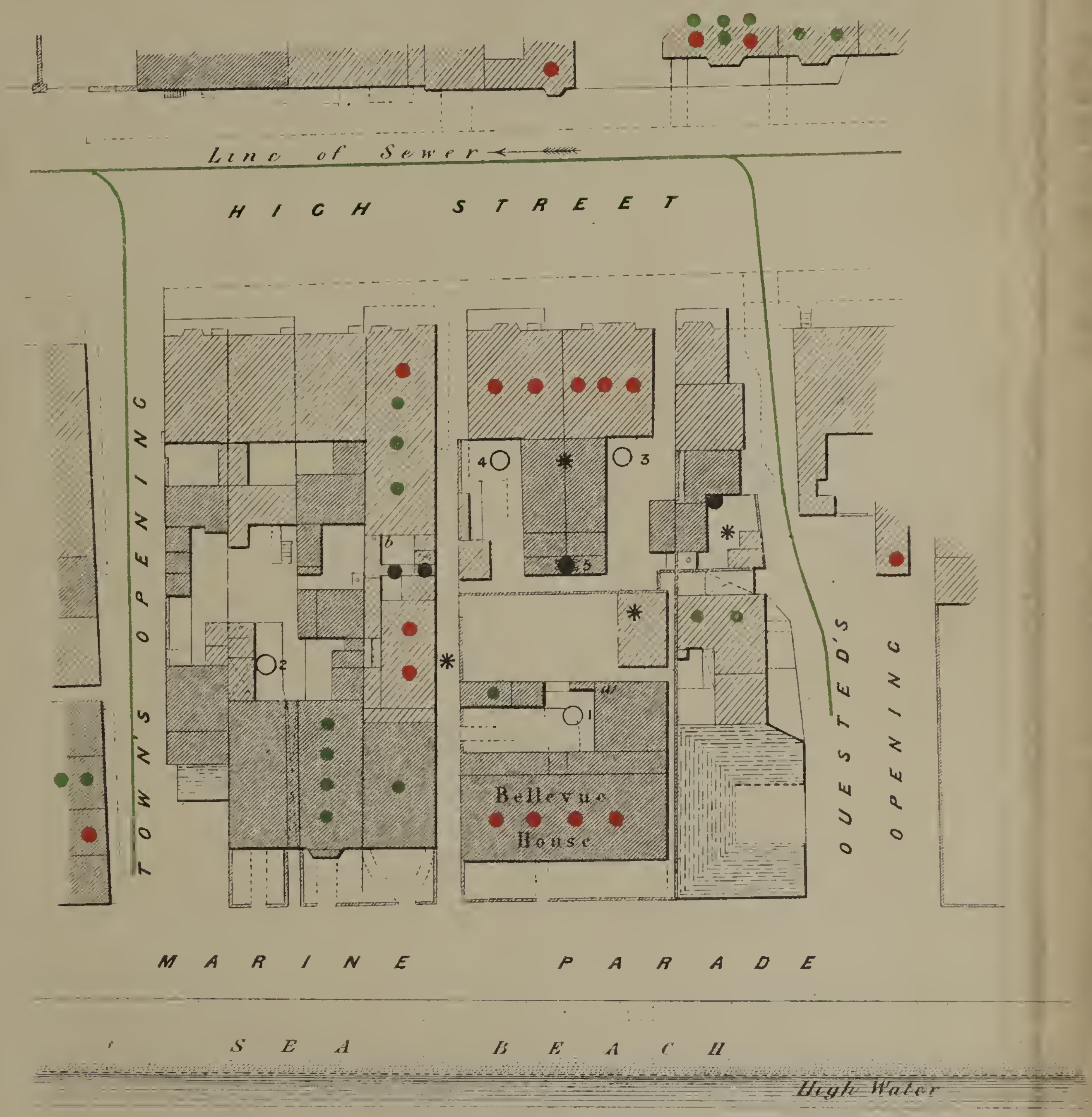
Standidge & Co Lith. London

No 82 Ordered, by The House of Commons, to be printed 27th February, 1855

PLAN No 2.

SANDGATE INQUIRY.

DETAIL PLAN OF A PORTION OF THE TOWN, referred to in the Report.



REFERENCE.

Fatal Cases of Cholera ……………… ●
Non-fatal Cases of Cholera } ●
Diarrhoea and Fever }
Cesspools not filled up ……………… ○
d° .. filled up ……………… ●
Well or Pump ……………… ✱

Scale 10 feet to 1 Statute Mile.

Feet 50 40 30 20 10 0 50 100

Standidge & C° lith. London

Ordered, by The House of Commons, to be printed, 27th February, 1855.

CHOLERA (SANDGATE).

REPORT made by Mr. *Thomas E. Blackwell*, C. E., to the President of the General Board of Health (bearing date the 21st day of February 1855), on the DRAINAGE and WATER SUPPLY of *Sandgate*, in connexion with the late Outbreak of CHOLERA in that Town.

(*Sir Benjamin Hall.*)

Ordered, by The House of Commons, *to be Printed,*
27 *February* 1855.

[*Price* 1 *s.* 3 *d.*]

82.

Under 8 *oz.*

BOA VISTA FEVER.

RETURN to an ADDRESS of the Honourable The House of Commons,
dated 4 February 1848;—*for*,

A "COPY of Dr. *King*'s REPORT on the FEVER at *Boa Vista*."

Ordered, by The House of Commons, *to be Printed*, 10 *March* 1848.

TO SIR DENIS LE MARCHANT, BART., HOME DEPARTMENT.

Sir, Admiralty, 23 February 1848.

IN return to Secretary Sir George Grey's letter, addressed to my Lords Commissioners of the Admiralty, on the 7th instant, calling for a copy of Dr. King's report on the fever at Boa Vista, in order that the same may be laid before the House of Commons, in pursuance of a resolution, dated the 4th instant; I am commanded by their Lordships to send you herewith Dr. King's Report accordingly.

I am, &c.
(signed) *W. A. B. Hamilton.*

REPORT.

To Sir *W. Burnett*, K.C.H., Director-General, Medical Department, R. N.

Sir, London, 10 October 1847.

I HAVE the honour to lay before you the result of my inquiries respecting the origin, progress, and nature of the epidemic fever which prevailed at Boa Vista, one of the Cape de Verd Islands, in the years 1845 and 1846. And although, from the adventitious circumstances which preceded the outbreak of fever on the island, and other causes which have surrounded the subject with unusual difficulties, I can hardly expect to convince those who have long cherished opinions different from my own, yet I am not without hope that the following brief exposition of facts, ascertained on the spot, will afford sufficient information to enable impartial judges to decide whether the disease was in reality imported by the "Eclair," or derived its origin from other sources.

As I have had the opportunity, since my return to England, of perusing Dr. M'William's report, and the other official papers on the subject, I am now aware, that with the same earnest desire to find out the truth, that gentleman and I have not pursued our inquiries at Boa Vista exactly in the same manner. For instance, Dr. M'William's documents exhibit, with great minuteness and circumstantiality, the communication of the fever from one person to another in different parts of the island; particulars which I have thought it necessary merely to generalize upon in the following report: while, on the other hand, I venture to presume that I have succeeded in establishing arguments in support of my own views, deduced from indubitable facts which remain altogether unnoticed in the report of Dr. M'William.

Under these circumstances, and as we have arrived at opposite conclusions, it is perhaps necessary for me to give some explanation as to the objects I had in view in commencing this inquiry, and the manner in which I conducted the investigation.

I received my instructions at Plymouth, on the eve of sailing to the Cape de Verd Islands; and as they are a copy of those furnished to Dr. M'William, so far our cases were alike; but Dr. M'William's duties had reference to Boa Vista alone, and he was not limited as to time; mine, on the contrary, were more extensive, and you will remember, Sir, that one month only was allowed me to accomplish the work at Boa Vista. But in your last communication, when urging me to zeal and diligence in the performance of my duty, you stated that within a shorter period I should be removed from the island. Now, whether those intimations were kindly intended to assure me that I should not be left for any length of time in that supposed region of desolation and death, I know not; but I understood them only in the literal sense, and at once decided on that plan of inquiry which I afterwards adhered to in my researches on the island: viz. first to ascertain the nature of the fever; next, to trace its connexion with the sick of the "Eclair;" and, lastly, to find out from what cause or causes, and in what manner, the disease was propagated among the inhabitants.

My first object, then, was to ascertain the nature of the fever, and, of course, its identity with the disease of the ship. But on my arrival at Boa Vista on the 23d of December, I found there were fewer opportunities of deciding even that point than I had been led to anticipate, not only from the reports which were current in England before I sailed, but from what I learnt at Madeira, and still later at the neighbouring island of San Nicholas. Within two hours, however, after being landed at Port Sal Rey, I was introduced to two cases of fever. The first was a poor slave in a wretched hovel, but he had been ill more than 20 days, and was then moribund. The second patient occupied part of the ground floor of the consul's house, where I lodged; but his was a case of rheumatic fever only, and soon terminated favourably. I next saw a few slight cases of fever at Rebil, and, subsequently, I visited five or six cases at Joao Gallego and Fundo das Figieras, in company with Senor Laoa; and in short, wherever I learnt that any one had fever, I went immediately to observe the disease; and as I had an ample supply of medicines, I generally prescribed for the patients at the same time. But altogether I saw, perhaps, only 14 or 15 cases of fever, and for the simple and satisfactory reason that there did not occur any other examples of this disease on the island during my sojourn there of six weeks.

On the evening of my arrival I had the pleasure of meeting Senor Laoa, a very intelligent officer belonging to the Portuguese navy, but a thorough contagionist, who informed me he had then a patient at Rebil dying with yellow fever. I proposed to him to proceed there at once; but this he declined, as he had just returned, and was somewhat fatigued. He, however, politely acceded to my request to be allowed to visit the patient with him next morning; and should the case have terminated fatally, as he fully anticipated that it would, to make a post-mortem examination of the body. An early hour was appointed for our journey. The revelation of one solitary autopsy might not have added anything new to our present stock of pathological knowledge of the same disease in other parts of the world; but on this occasion, where the patient died from a disease which had been so general and so fatal throughout the island, the result might have been important, and have enabled me, by arguments derived from analogy and comparison, to have shown, on clear grounds, the justness of my conclusions, that the disease which prevailed on board the "Eclair," and that which existed on shore, were essentially the same.

The opportunity, however, was lost; for I was informed, after waiting hours in vain, that the man had died, and was buried soon afterwards at daylight.

I must admit, then, that the opportunities which were afforded me of judging of the nature of the disease from personal observation were very limited; and I confess also that none of the patients had the pathognomonic symptoms of yellow skin, or black vomit, so much insisted on. But, from the general symptoms in the cases I did see; from the admission of Senor Laoa, that the patients I visited at Joao Gallego were the subjects of yellow fever; and from the testimony of all I conversed with or examined respecting the symptoms which characterized the disease throughout its course; I am decidedly of opinion that the diseases were identical. The question, therefore, whether the calamity on the island was merely an accidental coincidence, or resulted from the direct operation of certain laws of contagion, must be decided on other grounds.

The second object I proposed to myself was to trace, in the shortest time allowed me, the connexion between the fever on shore and the disease of the ship; and this part of the investigation, which I considered most important, I conducted in the following manner: I examined every day a certain number of persons who were said to have had direct or indirect communication with the ship or the people on the island, until I obtained, by personal interrogation, the evidence of all the survivors of the labourers, the washerwomen, and the soldiers. The questions I put them were few, but very plain:—1st. How many days were you employed on board the ship, in the launches, or at the island? 2d. When were you attacked with fever? 3d. What number of persons were in your family? 4th. When were they (your family) taken ill, and how many died? And, lastly, had you the benefit of medical advice, or medicines?—The examinations were carried on by the kind assistance of Senhor Baptista and John Jamieson, the consul's storekeeper, as interpreters; and the replies of each person were recorded on the spot, and carefully transcribed into another book at my lodgings.

Instead of sending you a copy of that document, I have compressed the information it contained into a kind of synoptical table, which shows the names of the persons, in the order of succession, as they were attacked with the disease.

In arguing the question of the origin of the disease on the island, I shall have occasion frequently to refer to this list; but should any discrepancies be found on comparing it with the result of Dr. M'William's examinations, I have still the original papers to prove (if necessary) that I have not erred wilfully.

The last object I had in view was to learn from what cause or causes the disease originated in the island, and to ascertain the manner of its propagation among the inhabitants. If the testimony of the people themselves is to be considered exclusively as evidence of the contagious nature of the fever, then I must admit (as they are all contagionists) the conclusion is inevitable, that the disease was introduced by the ship, and was communicated in the same manner, from one person to another, in the island. But the same cry of contagion has been always heard during the prevalence of epidemic disease in every part of the world, whether it was cholera or influenza, the plague, or the yellow fever; and although the delusion respecting the first two diseases lasted for a time, the fallacy was at length exposed, and but few men of practical experience will now maintain that either cholera or influenza belongs to the category of contagious diseases. Is this highly important question, then, to be decided, in the absence of all recorded or documentary evidence, by the oral testimony alone of persons in the lowest condition of civilized life, who are ignorant and uneducated, and who are always sadly perplexed when referring to the dates and particulars of memorable occurrences, even in their own families? But enough of this; I am certain that the value of their evidence will be duly and impartially weighed: I shall therefore only add here, that I listened with the utmost patience to all that was stated in favour of the doctrine of contagion.

Part I.—*The Fever at Boa Vista.*

In your letter of instructions to me, dated 30 November 1846, the general matters of information to be obtained were comprenended, together with certain other points requiring more particular notice. These latter details are distinctly specified in the subsequent questions, which, for the sake of brevity, I have recorded as follows, with the answers annexed.

Query 1. Ascertain whether fever was prevalent at Boa Vista or in any of the neighbouring islands at the time the "Eclair" arrived there; and if so, how long?

It does not appear, from the statements of the people, whether in the better or lower classes of society, that fever was prevalent at Boa Vista at the time the "Eclair" arrived there in August 1845; and they are equally positive as to the healthiness of the other islands.

Query 2. What was its character; epidemic, endemic, or sporadic?

The reply to the first query renders it unnecessary for me to say anything at present of the character of a fever which, it must be allowed, did not prevail at that time in the island of Boa Vista. And I am sorry to say that, owing to the rigid enforcement of the quarantine laws, I had no means of ascertaining whether fever appeared about the same time in the neighbouring island of St. Jago, where the disease is known to be endemical, and in certain years has been epidemical, and very fatal.

Query 3. Did it originate in the island, or in any of the other islands?

All with whom I conversed, except Dr. Almieda, insist on it as a fact not to be doubted, that the fever was imported by Her Majesty's steamer "Eclair," and therefore its origin was not to be referred to Boa Vista nor any of the other islands: Dr. Almieda considers the disease to have been an aggravated type of the bilious remittent.

Query 4. Is there any proof of its being of a contagious nature, or data to lead to a contrary conclusion?

It is universally believed by the inhabitants to be of a contagious nature; but, excepting the unfortunate arrival of the "Eclair" with fever on board previously to its breaking out on shore, I have learned nothing to lead me to that conclusion. On the contrary, I shall be able to adduce various facts which I think will amount to strong presumptive proof that the disease originated in the island.

Query 5. Obtain particulars with reference to the strangers, or islanders, who visited or were employed on board the "Eclair," while she remained at Boa Vista; or other individuals, or strangers, who were stationed in the fort on the small island, or visited the island, during the time the crew and sick of the "Eclair" were disembarked there; and ascertain if any of either of those parties have since been affected with a fever similar to that of the "Eclair:" and if so, obtain

"A list of their names; date of attack; and results of the disease."

And state whether it appears the disease was contracted from some morbific agent of a miasmatic nature, generated or existing within the vessel, or from exposure to a specific contagion emanating from the bodies of the sick; the latter query applies to the soldiers stationed in the fort as guard.

The whole of the persons (chiefly coloured men) who were employed on board or at the island, either in coaling or watering the ship, or cleaning the holds, were subsequently affected with a fever similar to that of the "Eclair." In general, however, it manifested a milder character, but still there is no doubt that it was essentially the same disease. I have made out a correct list of their names, the date of their attack, and the results; and, having analysed the whole, I am bound to state my opinion candidly, that it does not appear to me at all probable that fever was contracted by the labourers (except in one instance) even from the malaria which certainly existed at that time on board the ship. And it is still more improbable that the disease arose from a specific contagion emanating from the bodies of the sick, because I am fully persuaded that the labourers were not exposed to the influence of such a cause, even had it existed. But, allowing that the majority of the people employed had direct communication with the sick on board and at the fort, where is the proof of contagion? Is there a clear and palpable chain of evidence connecting, as cause and effect, the fever of the ship with the epidemy on shore; or, in other words, were the labourers thus exposed to a presumed specific contagion at its source, where it might be considered to exist in its highest degree of concentration, infected with the fever in its worst form, and within a reasonable space of time; and was the disease in the same manner transmitted to their families?

From the *vivâ voce* testimony of the men I examined, it might be inferred that they all had the disease in its malignant form, with yellow skin, black vomit, &c.; and that those symptoms did actually appear in some of the fatal cases I have no reason to doubt. But that five-sixths of their number should have recovered from that all but hopeless stage of the disease, is to me quite incredible; and I am inclined therefore to suspect that such statements were made partly from interested motives, as it was fully expected that the British Government was about to make a pecuniary compensation for their sufferings from a strange and pestilential disease, introduced by an English man-of-war.

As, however, I have already admitted the identity of the disease on board with that which subsequently prevailed on shore, notwithstanding the difference in their degree and intensity, it is unnecessary to dwell longer on this part of the question; but the next is of paramount importance, and requires serious consideration:

sideration: Did the disease become manifest in any of the labourers, excepting Lewis Pathy, within a sufficiently brief space of time to lead us necessarily to the conclusion that it (the disease) was derived from the sick of the "Eclair?" because it is not generally supposed that the period of incubation in malignant fevers exceeds 10 or 12 days, and the Academy of Science at Paris has even limited that preliminary stage of the plague itself to one week.

If the above rule is applicable to the fever of Boa Vista, the history of its progress among the labourers does not warrant that conclusion; for it will be found, on referring to the accompanying list of names, and the dates of attack, &c., that the few (comparatively speaking) who first suffered were only affected with the fever between the middle and the end of October, one month (at least) after the steamer left Boa Vista, on the 13th of September. A greater number were taken ill in November, when the fever was common everywhere; but the majority of the 63 persons who were employed watering or on board the ship, or at the island, did not become affected with the disease until December 1845, and January, February, and so late as August and September in the following year. Moreover, when the same rule is applied to the fatal cases, it becomes still more apparent that the disease was not propagated by contagion, because six weeks had elapsed before the first man who died was attacked with the disease; the next four contracted the fever in November, or two months after exposure to the supposed specific contagion; but five of the 10 labourers who died had no symptoms of illness until December, or three months after the departure of the "Eclair;" and although it may be conceded that the disease in these men manifested every feature of the true yellow fever, yet no other case in their families terminated fatally.

I think it necessary, not only for the sake of perspicuity, but in order to avoid the charge of slurring over hastily any circumstance in favour of contagion, to state here the substance of what was communicated to me in the presence of several witnesses, by Lewis Pathy himself, the person I have alluded to as having possibly contracted fever from the malaria on board the ship. Lewis Pathy was employed two days on board the "Eclair;" the ship sailed from Boa Vista on the 13th September, and he was attacked with fever on the evening of the following day, at a dance in Moradinha, in the district of Rebil. The disease was very mild, and lasted only a few days; about a month afterwards, however, his three children caught the fever, and they all died; and in the succeeding month (November) his wife was laid up with the same disease, and died also. They had not in their illness, nor indeed had the great majority of the inhabitants, the benefit of either medicine or medical advice. It is not unlikely that the above facts may be considered by some as illustrative of the operation of a specific contagion, but for my own part I have yet to learn when and where the man himself was ever within the sphere of its influence; and as the same fever commenced in some of the most remote villages at the end of October, shortly after Pathy's children died in Rebil, and as his wife was not attacked until about the middle of November, when the disease was general throughout the island, I can perceive no just grounds for referring the origin of the fever from which this individual and his family suffered, and which subsequently prevailed on shore, to the "Eclair," or admitting its contagious property.

But if Lewis Pathy, who was employed only two days, carried the fever to Rebil on the 14th September, it is rather inexplicable that more than 50 men, nearly all of them married, who were more exposed to the presumed specific contagion from a longer service in the ship, in the boats, and on the island, and who returned to their own houses in the same villages every evening, had no symptoms of disease themselves, or their families, until October, when the rainy or sickly season had commenced.

It would be out of place were I now to enumerate the various facts in my possession which afford strong evidence that the disease originated in a vitiated or malarious state of the atmosphere; but this I may assert, that if fever ever does arise from such a cause (and I have no doubt of it), Boa Vista abounds with the elements for its production, and that the autumnal seasons of 1845 and 1846 were most favourable for its developement. And I may also state, in reference to the sickness of Lewis Pathy and his family, that if there is one spot more than another in the whole island where, from its physical peculiarities, endemic fever might be expected to begin first and end last, that locality is Moradinha and the villages in its vicinity, in one of which Pathy resided.

It is time now to consider how far, and in what manner, the sickness and mortality among the soldiers bear on the important question at issue.

It appears, then, that of the three soldiers who constituted the guard at the fort when the "Eclair's" people left the island, two, a corporal and a private, were attacked with a fever resembling that which prevailed on board the ship; and these men died respectively on the 21st and 22d of September, after an illness of five or six days.

To those who assert that the yellow fever is highly infectious, and in no way connected with malaria or unhealthy situations, it will be of no avail to point out that both men were pre-eminently exposed to the attack of endemic fever, as they were Europeans, and had but lately arrived in the colony; but, at any rate, none of the soldiers were ever on board the "Eclair," and I have no reason for believing that any of them were permitted to enter the sick apartments at the fort.

I shall say nothing more at present respecting the two men who died; but, as it has been assumed that the surviving soldier, and another who joined him at the fort, communicated the disease to Anna Gullinha and the inhabitants of Port Sal Rey, it is necessary to dwell a little on this part of the evidence, and examine minutely the grounds for such an opinion.

Miguel Barbasa informed me that he was attacked with slight fever some days after his comrades died at the fort: on that account he and another soldier, Pedro Manoel, who had been sent to assist him in attending the sick, were then removed to Port Sal Rey, and restricted to the occupation of a small hut at the northern end of the town. They remained in that hut 17 days, but he said they had no communication with any one. Miguel soon recovered, and as Pedro Manoel continued in good health, and their services being now required in the barracks, where the fever had already commenced, all restraint was removed, and they returned to their military duties. After a residence of eight days in barracks, Pedro Manoel was at length seized with fever, about the end of October; but in his case also the disease passed off favourably. Now, if the soldiers were visited by Anna Gullinha and others, it may be asked what was the object of their seclusion, and how is the reckless conduct of their visitors to be reconciled with that dread of the fever which it is said pervaded all classes? Their washing and cooking are mentioned as an excuse, but I fear and believe there was but little, if any, occasion for either. Anna Gullinha (who was attacked on the 12th, and died on the 16th of October) was, I believe, the first who died from fever on the island of Boa Vista.

The perplexing question then again occurs, how did it happen that the disease (if contagious) was not introduced into the town at an earlier period by the labourers, who were quite as much exposed as the soldiers to its presumed fatal influence, and were daily employed from the 1st until the 13th of September, associating freely with their acquaintances, and sleeping every night in their own houses in the town?

As might be expected, there are a great many poor and miserable hovels in Port Sal Rey, and there is dirt and filthiness everywhere; but in that part of the town called Biera, or Pao de Varella, where Anna Gullinha and the soldiers resided, the houses are of the lowest description, and the people who occupy them are generally very poor and destitute. But independent of these remote causes of disease, which operate injuriously in every climate, there were others which claimed the pre-eminence.

Swamps are numerous in the vicinity of Port Sal Rey. But there is one large pool of stagnant salt and fresh water, immediately behind, but to windward of this part of the town; and still nearer to the houses, there is a locality which is resorted to by many of the people when obeying the calls of nature; and the exhalations from the one, and the effluvia from the other, are blown by the usual winds in the direction of Biera. Should it be objected, that the operation of the same causes in former years did not produce the same deplorable results, I need only reply that the season of 1845 at Boa Vista was most unusual, and in many respects very remarkable.

The late lamented Mr. M'Cauly, in his letter to the Earl of Aberdeen, dated 24th of September 1845, writes as follows: "But so long an interval had elapsed between the departure of the 'Eclair' and the appearance of this case of fever in the town (Anna Gillunha), that we were all disposed in the first instance to attribute it, as well as the general sickness of the place, rather to stagnant water, which had settled in great quantity at the back of the town, joined with the great heat of the weather, and the dirty state of the streets." And Mr. Consul Rendall, in his official letter to the same nobleman, dated 22 December 1845, says: "Up to the 9th of October, extraordinary heat and the fall of a large quantity of rain had been experienced; events which were surprising to the oldest inhabitants."

The information I received in the island in 1846 fully corroborated what is stated in the above extracts; which, with other concurrent circumstances, have led me to the conclusion, that at the end of September or beginning of October the atmosphere had become vitiated and malarious.

I shall conclude what I have to say on this part of the subject, by referring to the annexed list, furnished by the commandant of the troops; wherein it appears that, after the death of the two Europeans at the fort, no other casualty occurred in the barracks until the 8th of November, nearly two months after the departure of the "Eclair."

Query 6. Whether there is any direct proof of the disease having been communicated by the inhabitants to a second party, and from that to a third party, and so on; and if any men have died in the fort, to make particular inquiry if they were on board the "Eclair"?

The inhabitants in general are firmly persuaded that the fever was imported by the "Eclair," and afterwards spread throughout the island (by contagion) from one person to another. I have taken considerable pains to trace out and discover the supposed morbid concatenation, but in vain. It becomes, therefore, a duty to express my opinion decidedly, that there is no satisfactory proof of the disease having been propagated by contagion, or from a specific poison which is said to emanate from the bodies of the sick, the dying, or the dead. The only two men belonging to the island who died at the fort were soldiers (as I have already stated), but they were never on board the "Eclair."

Query 7. Whether it appears the fever was communicated to any individual in the house where the sick officers and their servants resided, or to any person in their immediate vicinity?

It does not appear from the information I have received, that fever was communicated to any individual in the house where the sick officers and their servants resided, or to any person in their immediate vicinity. The owner of the premises, the judge, and his two servants (Europeans), re-occupied the same house soon after the ship left; one of the servants, however, was attacked with fever, and died at the end of December, being an interval of three months after the ship's departure.—Information from Celestina de Rocha and others.

Query 8. Whether any of the women who washed the officers' clothes contracted fever; and were they Africans or islanders, black or coloured?

The women who washed the officers' clothes were islanders, black and coloured, and they all had fever subsequently. The soiled clothes (linen, cotton, and flannel), which had accumulated in the officers cabins from the time of their departure from Sierra Leone, were contained in at least 12 bags, which were taken on shore at Port Sal Rey the same evening the ship arrived, and distributed next morning (22d August) to the washerwomen of the town. Now, if the disease possesses the power of reproduction, its poison must have been as certainly communicated through the medium of fomites as by direct contact with the sick on board or at the fort: yet none of the washerwomen nor any in their families were attacked with fever until November, showing an interval of 70 days after exposure to the infection.

Four washerwomen died from fever; the three first in December, and the last in January 1846; but all the other members in their family recovered.

Query 9. Whether there is any proof of the same disease breaking out in any other parts of the island where, from the distance from the town and anchorage, or other circumstances, the inhabitants could have had no communication either direct or indirect with the "Eclair"?

The same disease broke out at the end of October, in the villages of Joao Gallego, Fundas Figieras, and Cabeca Taraffe, on the eastern side of the island, and distant at least 16 miles from Port Sal Rey. They are separated about a mile and a half from each other, but the common road to the latter (Cabeca Taraffe) passes through the two former.

The first case of fever appeared in Cabeca Taraffe on the 27th October; the next in the intermediate village of Fundas Figiuras, on the 31st October; and the disease commenced in Joao Gallego, which is nearest to Port Sal Rey, on the 1st of November. I received the above information from the judge at Fundas Figiuras, to whose hospitality and kindness I was indebted for a night's lodging, &c. John Jamieson, the consul's storekeeper, who had the management and superintendence of all the labourers, stated to me repeatedly that none of the people belonging to the eastern villages were employed in any manner about the "Eclair;" and as it is well known they entertained the greatest dread of the fever, it is not reasonable to suppose that they had any communication with that vessel, either direct or indirect.

It may not be inappropriate to mention here some particulars respecting the fever in Estacio, or Old Town, which is situated about 10 miles to the southward of Port Sal Rey, and where there must have been communication with the ship, as some of the labourers who had been employed on board and at the fort resided there. The fever did not appear in the town until after the middle of November, two months at least after the "Eclair's" departure. The first death occurred on the 24th November; four persons died in December, and the rest of the 22 cases which terminated fatally were cut off in January and February 1846. The above facts were communicated to me by the judge at Old Town.

Query 10. Whether the disease has spread to any of the neighbouring islands, and by what means?

From all I could learn at Boa Vista, there are no grounds for believing that the disease was carried to any of the neighbouring islands by those who departed after the fever broke out in 1845.

Query 11. Whether there are any circumstances from which it may be inferred that the fever lately prevalent at Boa Vista was an indigenous production, or that it originated in causes unconnected with the "Eclair"?

Assuming, for the present, that there is no direct or satisfactory evidence of the fever having been communicated to the inhabitants by the "Eclair," I shall notice very briefly a few circumstances from which it may be reasonably inferred that the disease was an indigenous production, and that it originated in causes unconnected with the "Eclair."

1st. The situation of Port Sal Rey, and the whole district of Rebil, in the immediate vicinity of swamps and pools of stagnant water, and the patches of rich alluvial soil near the other villages, expose the inhabitants to those noxious exhalations, during the autumnal months, which are generally admitted to be the common remote causes of fever. The lower classes are extremely poor, and often badly fed; they breathe a polluted atmosphere in their crowded and ill-ventilated abodes; and there is a general disregard of cleanliness in the streets and about their houses. Now, such a combination of morbid causes would produce malignant fevers in any part of the world; but in Boa Vista, in the years 1845 and 1846, there was this addition or aggravation,—the common atmosphere was unusual and epidemical.

2dly. The testimony of the most intelligent men of the island, including Dr. Almieda, Senor Baptista (the consul's agent), the mayor of Rebil, the judge of Fundas Figieras, the judge at Old Town, removes every doubt as to the fact that fever prevails to a certain extent, and carries off several of the inhabitants, in the months of November and December every year; and this endemic fever, which recurs annually, and which Dr. Almieda calls the bilious remittent, does not always present the same mild aspect and character: on the contrary, it is well known that in certain years the disease was epidemical, and, in comparison with other seasons, very fatal.

3dly. It has been generally observed that the prevalence of malignant fevers, not only in Boa Vista but elsewhere in tropical regions, is preceded and accompanied by an unusual and peculiar state of the atmosphere. Such was undoubtedly the case at Boa Vista. Whether this peculiar constitution of the air depended on the causes I have mentioned, or on some deleterious emanations from the earth or its surface, its general operation was evidently inimical to animal life in all its gradations.

Lastly. That the common air which was inhaled by every living thing on the island was in an epidemic condition in the months of October, November, and December, in both years, is sufficiently demonstrated by the simultaneous occurrence of universal sickness and great mortality among the cattle (including cows, horses, mules, donkeys, and goats) at the very time that fever was raging among the inhabitants. And further, there was this remarkable coincidence, that after an interval of some months, and the disappearance of disease both in man and beast, the same fever broke out again in the towns and villages about the rainy season in the following year, and was again accompanied by the same murrain among the cattle, which in the two seasons proved fatal to two-thirds of the whole stock of the island.

Query 12. To be very particular in your inquiry as to the state of the weather (as related by the Governor-general of the Cape de Verds, and the British consul) previously to the commencement of the fever; and to take every pains to ascertain the date of its commencement, and its effects upon the surrounding country; and, as far as possible, to affix dates to all the transactions. And it having been reported that a similar fever prevailed at Boa Vista in 1829, causing the departure of a number of persons from the island, you are to make particular inquiry respecting the circumstance.—

The periodical rains, contrary to what usually happens, did not set in until late in September 1845; and the fall, though heavy at first, was altogether less in quantity than had been known for several years. In October, November, and December the winds were light and variable, with frequent calms; and the weather, in consequence, extremely sultry and oppressive. The grass and green crops were nearly destroyed by the long previous drought; and what little appeared after the rains was devoured by the locusts, which visited the island in greater numbers this year than was ever known to be the case before. The loss of their cattle in 1845 was attributed to starvation, as the crops had been destroyed by the causes I have just explained; but the greater number died in the following year, when every kind of food was most abundant. In 1846 the rains began about the middle of August, and fell in abundance in the three following months; but, as in the former season, the winds were light and variable, the calms frequent, and at length the atmosphere became stagnant and pestilential. I could not obtain any information respecting the fever which, it is reported, prevailed at Boa Vista in 1829; but from the notes of Senor Baptista I find that in 1821, 39 persons died; in 1822, 53; and in 1827, 42 persons were carried off by fever. The schoolmaster at Senhora das Dores informed me that numbers of cattle died in the different islands in 1833, but he did not recollect how many persons died in Boa Vista at the same time.

Query 13. Ascertain, if possible, what number of deaths took place on the island of Boa Vista previous to the arrival of the "Eclair" at that anchorage; and how long the "Eclair" had left the island before the general sickness took place?

I found it quite impossible to ascertain the number of deaths that took place in the island for two months previous to the arrival of the Eclair. The fever, however, became general about two months after her departure.

Part II.—*The Fever on board the "Eclair."*

Having failed in my endeavours to trace out the unbroken chain of connection between the disease on board the "Eclair" and the fever of the island, and its propagation among the inhabitants by contagion, I must now revert to the facts and circumstances relating to the fever among the crew of the ship at Sherbro, Sierra Leone, and at the fort on the small island near Boa Vista, as it is absolutely necessary to learn when and where a new and specific disease was introduced, or how and under what circumstances the bilious remittent of the coast became a contagious disease. It appears from Dr. Stewart's report that the ship was almost always off Sherbro from the 18th of January to the 4th of July, blockading the eastern outlet of the passage at Sherbro, and during that time lost 10 officers and men. It is very probable, from the position of the ship in the mouth of the river, in filthy looking water, the washings of the mangrove marshes, that the people on board were not beyond the influence of the noxious exhalations from the shore; and as they were certainly predisposed to disease by the insidious and depressing operation of moral causes, disappointment, despondency, and their dull monotonous life, the origin of the fever might be explained on such grounds alone; but that conclusion is not warranted, for they were all equally exposed, and yet but few (in comparison) who remained on board were attacked with fever at this time.

As the late Mr. Maconchy has not mentioned any circumstance which would lead to the supposition that the disease originated on board the ship, and as he knew well it was not contagious, it may be inferred that he attributed the fever to the exposure of the men in the boats and on shore. In his nosological report between the 1st of April and 30th of June, it is stated, "our boats went four times with from 30 to 40 men, for seven or eight days, into the Sherbro river; and whether the people slept on shore or in the boats, they must have been fully exposed to the influence of a tainted nocturnal atmosphere." Now it is well known that the duty in boats up the African rivers involves considerable risk at any time of the year; but it can never be practised in the rainy season without endangering the health and lives of all who are employed, and such were evidently the sad consequences of the boat expeditions of the "Eclair."

The first severe case of fever occurred on the 3d of April, in a man who had been in the boats. Of another party, who returned to the ship on the 7th of April, two men were seized with fever on the 18th, one on the 19th, and one on the 20th, and three of the four died; but, in short, eight of the 10 men who died off Sherbro had served in the boats. There can be no doubt, then, that some of the above men contracted the fever on shore. But two of the 10 men who died had not been out of the ship; three of them had been so long on board that it is doubtful, and indeed highly improbable, that they caught the disease on shore; and it is not clear that the remaining seven of the 17 men who were attacked with fever at this place had ever been employed in the boats. I am inclined therefore to believe from the above (otherwise inexplicable) occurrences, and from the information I received, that the holds of the "Eclair" were in a bad condition; and from the melancholy history of the progress of the disease on board subsequently, during a period of six months, that the operation of a morbific cause of a miasmatic nature, in the ship itself, was there first manifested.

The malignancy of the fever, even at this time, may be inferred from the great mortality, and the unavailing efforts of the surgeon in most of the cases to avert a fatal termination. One man died after an illness of three days; two of five days; two of six days; two of seven days; and one died on the 9th, one on the 11th, and one on the 13th day after they were attacked with the disease.

The important and interesting question, then, is now to be considered: was this fever essentially the same as that which prevailed after leaving Sierra Leone, and at Boa Vista? It is universally allowed that the fever off Sherbro was the bilious remittent (which is not a contagious disease), and the same term is applied to the disease afterwards by all the medical officers who had an opportunity of judging from personal observation.

The consideration of the general symptoms which were, no doubt, modified at that early period of the sickly season, and the short duration of the disease in the fatal cases, would incline me to believe that the fever was essentially the same from the first to the last; but when I find in the account of three post-mortem examinations, that "in one the stomach contained reddish glairy matter;" in another, the stomach was distended with a dark serous fluid mixed with black flakes (incipient black vomit); in the third, fluid blood exuded from the nostrils and blistered back; while the body of another patient is said to have become yellow after death: I have no hesitation in recording my opinion that the fever off Sherbro was of the same nature and character, and had the same attributes, as the worst cases in the fort or on the island of Boa Vista.

The circumstance of the arrival of the "Eclair" in a healthy state at Sierra Leone on the 5th of July, is quite incompatible with the idea that the previous fever was contagious. It is necessary, therefore, to inquire whether a new and specific disease was communicated to the ship's company at this place; for it is unquestionable that after leaving Sierra Leone the fever again broke out, and in a more aggravated form.

Deputy-inspector Dr. Stewart informs us, in his report, that the "Eclair" arrived at Sierra Leone on the 5th of July, and anchored close to the shore, near the Commissariat-office, and remained there until the 23d. Two days after their arrival the crew commenced cleaning and whitewashing the holds and store-rooms; and they were again employed in the same duty at the end of July and beginning of August; a part of the ship's company were also employed at the same time in paying off the "Albert;" this duty included among other matters the cleaning of her holds, which did not appear to have been previously attempted since the Niger Expedition, and was rendered irksome by the strange accumulation found there. Captain Estcourt allowed the crew of the "Eclair" to go on shore in small numbers at a time, and this indulgence was granted in the middle of the rainy season; some of those who came off at the expiration of their leave were allowed to go on shore a second time. Three men, although not sleeping on shore, remained until late; and 11 men are said to have slept on shore, some of them for several nights.

Had there been nothing more remarkable in the history of the disease on board the "Eclair" than the death of a considerable number of men shortly after leaving Sierra Leone, the cause of their illness would have been easily and satisfactorily explained. They had been exposed under the most unfavourable circumstances to the influence of causes peculiar to the country, which produced the disease, and at a season when few Europeans (lately arrived) escape an attack of the endemic fever, and where, from local aggravations, fever of a malignant type might be expected. They wandered in the streets drenched with rain, and committed excesses in the lowest haunts, in the worst and most unhealthy parts of the town. There was no epidemic condition of the atmosphere however, although it was the rainy season; and from what I learnt subsequently at Sierra Leone, there was nothing unusual at that time either in the nature or amount of disease in the settlement. It is not hinted that the sailors were exposed to infection from persons actually labouring under the disease; indeed it is not certain there was a single case of sporadic yellow fever in the town previous to their arrival; I am at a loss, therefore, to understand how its origin can be explained on the principles of contagion. The "Eclair" left Sierra Leone on the 23d of July, anchored some little time off the coast, and arrived at the Gambia on the 10th of August. In that short time, however, several men, chiefly those who remained on shore at Sierra Leone, were carried off by fever, some of them with black vomit. After calling at Goree, the ship proceeded to Boa Vista, and arrived there on the 21st of August. It appears by the surgeon's report that from the 19th of July, when the first case of fever was entered on the sick list, until the 31st of August, when the ship's company was disembarked at Boa Vista, 44 cases of fever occurred, and 16 of them terminated fatally. Without assuming at present that there were any just grounds for believing that the cause or causes of the fever had a local origin in the ship, it may be inferred that this idea was entertained by the superior officers, or they would never have attempted to clear the holds at Sierra Leone in the rainy season, and within one month have again commenced the same laborious work at Boa Vista; and it is equally improbable (but from some apprehension of the kind) that they would have removed the men from the ship, and lodged them, at that hot season, in such a miserable place as the fort at Boa Vista. I visited the fort on the 16th of January 1847. On entering by the small gateway, which is the only inlet exposed to the trade winds, I was immediately struck with the tokens of neglect and decay visible in every part of the building; but, had the whole interior been in good repair, it did not appear to me to be at all capable of giving proper accommodation even to 50 men, and yet in this place were huddled together more than 100 men of the "Eclair;" many of these were, doubtless, in an ordinary state of health, but several were labouring under a malignant fever. Inside the door, on the left, I observed the dusthole (similar to the receptacles for manure near the stables or the mews of London), which was then two-thirds full of rubbish, probably the accumulation of years; and in the opposite corner of the court there were two common close privies. Independent of these sources of contamination, however, there could be no free circulation of pure air under any circumstances, owing to the plan of the building; but when the place was overcrowded, and the clothes and bedding of the crew and convalescents were daily exposed for the purpose of ventilation, the atmosphere which the men breathed must have been polluted and deleterious in the extreme.

Under such circumstances, with the thermometer at 86 during the day, and probably with heavy dews at night, the fever, instead of subsiding as they anticipated, raged with increased virulence. From the day the sick and the others were landed at the fort, until they were re-embarked, 37 cases of an aggravated type occurred, 25 of which proved fatal. But does it necessarily follow from the aggravated character of the fever, and the great mortality at this place, that the disease was, or had then become contagious? I believe not. It is true, a greater number were attacked in a given time; but, after all, the ratio of mortality barely exceeded that in the fever off Sherbro. Whether the common atmosphere possessed any latent epidemic property at this time, I know not; but from the brief description I have given of the fort, I imagine few will deny that there must have been a concurrence of causes and circumstances, not only injurious to those who were ill, but likely to induce a malignant disease in others who were in perfect health; and as I am fully persuaded that the crew of the "Eclair" had been exposed for a length of time to the influence of some deleterious miasma generated in the ship, and which, by a combination of causes, had become highly concentrated, the melancholy occurrences at the fort may, I think, be rationally explained without referring to the agency of contagion.

The holds of the ship appeared to be clean at Boa Vista; such also has been the case in other sickly ships; and yet, on examining minutely into hidden parts, it has seldom happened but accumulations of filth, of some kind or other, have been discovered, and justly referred to as the source of the disease. And such was actually the case in the "Eclair;" for, long after the people left the ship in England, and when the engines were removed, mud, some inches deep, was found under the flooring.

I should scarcely have noticed the above circumstance but for some remarkable occurrences which took place in the same vessel at a subsequent period, which confirmed me in the opinion I had previously formed that the origin and continuance of the fever on board depended solely on local causes.

The "Rosamond" (formerly the "Eclair") was commissioned at Woolwich, on the 5th of November 1846, for the Cape of Good Hope station, but none of the former crew rejoined the ship. During the time of fitting out, four cases of typhus fever occurred, and were sent to the hospital, where two of them died; but it is necessary to mention that typhus was prevalent at Woolwich at the time. The steamer left England, for the Cape, on the 23d of February 1847. Three days after sailing one of the men was affected with slight febrile symptoms, and he continued more or less indisposed for a number of days, but occasionally felt so well that he returned to his work. After the ship entered the tropics, however, the disease began to assume a new and alarming character; and when off the island of St. Nicholas, and almost in sight of Boa Vista, the man died, having had, for two days previous, black vomit and other characteristic symptoms of the yellow fever. Within a few days afterwards the "Rosamond" arrived at Ascension, where I was then stationed; and Commander Foot having communicated to Captain Hutton, the superintendent of the island, every particular respecting the illness and death of the seaman, I was ordered, with Dr. Sloan, the surgeon of the hospital, to make a report on the case, and at the same time to suggest measures for the benefit of the ship, without endangering the health of the people on the island. Having obtained from Dr. Slight, surgeon of the "Rosamond," every information relative to his late patient, we stated our opinion that the disease the man died from was sporadic yellow fever; and as the weather was then extremely sultry, and the hottest month in the year (April) approaching, and the hospital being full of patients, we recommended that the necessary supplies should be furnished without delay, and the ship hastened on to her destination, the Cape of Good Hope.

On the following morning I went on board with the view of learning something to enable me to form an opinion as to the sanatory condition of the ship, and for the purpose also of inspecting the sick, as the surgeon informed me he had then a suspicious case, with symptoms of a low kind of fever. I had barely time to take a cursory view of the after parts of the ship, when my attention was called to the patients, who were all mustered in the steerage; and I found the man the doctor had alluded to in such a precarious state that I recommended him to be be sent on shore immediately. The only other severe case was that of a supernumerary lad, who was taken ill the same morning, but the indications of a low malignant fever were so apparent even at that early stage as to induce me to express my opinion to the surgeon that he would not probably survive 24 hours. As it was most desirable to prevent a panic amongst the ship's company, I went on shore to consult with Captain Hutton, and make arrangements for their reception. The point was settled very soon; I was to take them, and two other lads who slept in the same part of the ship (and who were found to have incipient fever), to the sick quarters on the Green Mountain. The arrangement was quite agreeable to my wishes, as I was most anxious to avoid the risk of again complicating an important question, which has been already sufficiently mystified; viz., the contagious or non-contagious nature of the disease. Before we had half accomplished our short journey to the Green Mountain, the poor boy became delirious, and, without having had one favourable symptom from the commencement of the attack, he died at the sick quarters, after an illness of 36 hours. Had we made a post-mortem examination, I have no doubt that the matter of black vomit would have been found in the stomach or intestines, but unfortunately the assistant surgeon, Dr. Andrews, had forgotten his instruments in the hurry of leaving the garrison. The body, however, soon after death, assumed a dark and motley appearance, especially the abdomen, buttocks, and the lower extremities. The other three patients recovered slowly, but were at length cured, and discharged to Her Majesty's ship "Tortoise." None of the marines who attended them as nurses, nor the assistant surgeon, caught the fever; nor was it communicated to any one in the island.

The patients themselves attributed their illness to foul air in the fore part of the ship; one of them said he suffered so much from an abominable stench in the boatswain's storeroom that he represented the circumstance, and obtained permission to cut a hole in the floor, which exposed to view a considerable quantity of soft mud; and five or six buckets full of it, mixed with decayed shavings, and emitting an offensive odour, were removed at the time.

It appears, then, that besides an unusual number sleeping in the fore-cockpit, some of them at least had been exposed to a morbific miasma exhaled from a festering mass of filth in the bottom of that part of the ship. The quantity of mud, no doubt, was small in comparison with what had accumulated when the vessel arrived at Spithead from the coast of Africa; yet the malaria eliminated from that small and circumscribed focus was equally virulent in its operation, and produced the same disease in a few who were placed within the sphere of its influence.

I have now, Sir, brought under your notice all the facts and circumstances relative to the origin and propagation of the epidemic fever on board the "Eclair," and at the island of Boa Vista; and I beg leave to assure you that no point has been intentionally omitted which might tend to elucidate the subject, and lead to just conclusions respecting the nature and properties of the disease.

I have not been able to ascertain that the fever was communicated to a single individual by a specific poison, or virus, which is supposed by some to emanate from the bodies of the sick; but I trust I have brought to light a combination of remote and directly exciting causes in active operation, quite sufficient (and altogether independent of contagion) to account for the origin and spread of the fever, both in the ship and on the island.

I am fully sensible of the great responsibility I incur in presuming to offer a decided opinion on this momentous question; but having compared the results of the investigation which is now concluded, with the impressions made on my mind after repeated services in the West Indies, where I had unusual opportunities of studying the nature and character of the same disease, and particularly at Bermuda in 1843, where I am convinced the disease was neither imported nor manifested a contagious nature;* I must now declare my belief firmly, but conscientiously, that the yellow fever is not a contagious disease.

I have, &c.
(signed) *Gilbert King*, M.D.
Inspector of Hospitals.

Some time after the fever had commenced at St. George's and Ireland islands, one of the mail steamers arrived at the dock yard from the West Indies; and in the course of the day, one of the passengers, who died that morning or on the previous evening, was interred in the burying ground by the Rev. Dr. Mallett.
On

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* The Bermudas, although not situated within the tropics, but nearly in the latitude of Madeira, in the middle of the Western Atlantic Ocean, have suffered at different periods, like most of the West India islands, from epidemic yellow fever. The causes and nature of the disease in former visitations, I have nothing to do with at present; but as it has been rashly asserted that the destructive fever of 1843 was a contagious disease and a foreign production, it is necessary to meet the assertion with something more than a simple denial of the facts.

On the above circumstance alone was founded a vague but transient rumour that the person had died from yellow fever, and that the disease was thus introduced into the islands. The steamer, however, pursued her course to England, and in 16 or 17 days the passengers and crew were landed in perfect health, and dispersed to different parts of the kingdom. But at length every doubt on the subject was removed by the affidavits of the captain and surgeon, published in the "Bermuda Gazette," wherein they solemnly declared that the aforesaid passenger died from phthisis pulmonalis.

Had the disease been contagious, never was there a better field or a more favourable opportunity for ascertaining the fact, than was presented to the medical officers connected with the naval hospital at Bermuda. Fortunately we are all still living; but after all our experience, I believe we are more decidedly opposed than ever to the doctrine of contagion.

From the commencement to the termination of the epidemic fever, 1,210 patients labouring under the disease were admitted; and of whom 110 cases terminated fatally. Owing to the urgent demands for hospital accommodation during the time, the wards were much crowded, and in fact there was hardly room to pass between the beds. A large storeroom on the ground-floor was converted into (what I called by way of distinction) the foul ward, where we placed the patients who were received in an almost hopeless condition. The two large lobbies in the floors above were filled with patients we considered to be dangerously ill, and to each ward and lobby two male nurses were appointed, who remained there day and night.

The shirts, flannels, sheets, pillow cases, coverlids, and occasionally the sacking and hair of the beds, were all washed by females belonging to the establishment; and you will find, on referring to the quarterly returns of stores, that not one article was destroyed during the period of the sickness.

The medical staff of the hospital comprised one deputy-inspector and three assistant-surgeons; but when the latter were attacked with fever one after the other, I applied to Sir Charles Adam, the commander-in-chief, who immediately, and also at a subsequent period, sent medical officers from Halifax to assist in our labours.

In the daily routine of duty, we made three, generally four, regular visits to the hospital, where we took notes at least twice a day, at the bedside of each patient; and the senior assistant went through the wards every night.

Our first visit was to the foul ward, and commenced at seven o'clock in the morning; we next proceeded to the lobbies, and then visited the other wards, where the patients were either convalescent or had the disease in a milder form. After a hurried breakfast, we again met in the operation room, and inspected the bodies of those who had died in the night, and altogether we made 72 minute post-mortem examinations.

Is it possible, Sir, after what I have stated, to conceive any combination of circumstances more unfavourable, or any situation where the attendants on the sick could have been more inevitably exposed to the operation of a specific contagion? And yet only three of the 11 medical men suffered from the disease, in a mild form: one half of the servants, I believe, had not the disease in any form whatever; and it is a remarkable but highly important fact, that not one person of the 77 attendants I have alluded to, died from fever on that occasion.

G. K.

A LIST of MEDICAL OFFICERS who were Employed at the Royal Naval Hospital, *Bermuda*, during the Epidemic Fever of 1843.

NAMES.	RANK.	WHEN APPOINTED.
Gilbert King, M.D.	Deputy inspector	Belonging to the hospital.
William W. Baynes	Assistant surgeon	
Richard D. Mason	ditto	
John Page Burke, M.D.	ditto	
Supernumeraries:		
James C. Walsh	Assistant surgeon	21 August 1843.
James Laird	ditto	
Frederick M. Rayner	ditto	9 September 1843.
James Walsh, M.D.	ditto	
Mr. Harry Goldney	Surgeon	28 October 1843.
Mr. John Jeffcott	Assistant surgeon	
James Ray	ditto	

A LIST of Persons who were Employed on Board the "Eclair," and on the Island at *Boa Vista*, with the Number in their Families, and the Results of the Fever in 1845 and 1846.

No.	NAMES.	Employed.			When Attacked with Fever.	No. Died.	No. in Family.	When Attacked with Fever.	No. Died.
		On Board.	In Boats.	On the Island.					
1	Luis Fortes Pathy	2	–	–	14 September 1845	- -	5	Oct. & Nov. 1845	4
2	Pedro Ascensoa	5	–	–	October - „	- -	14	November - „	1
3	Silvester da Silva	–	–	12	October - „	- -	6	October - „	
4	Joaquim Pathy	4	–	–	October - „	- -	5	October - „	
5	Simoa Fontes Ramas	–	–	6	13 October „	- -	8	October - „	
6	Manoel Fachuia	6	–	–	October - „	- -	5	October - „	1
7	Joao de Silva Marques	–	–	4	October - „	- -	6	End of Oct. „	
8	Manoel Boavista	–	15	–	October - „	- -	3	End of Oct. „	
9	Manoel de Silva Marques	–	–	6	October and Nov.	- -	3	Oct. & Nov. „	
10	Joaquim Marques	–	4	–	25 October „	30 Oct.	3	October - „	
11	Implicio de Lus	3	–	–	1 November „				
12	Supreana Gonsalves	–	4	–	November - „	25 Nov.	5	November - „	
13	Jose Luis Marques	1	–	2	15 November „	- -	6	15 November „	1
14	Porterio de Sambos	some days			18 November „	24 Nov.			
15	Cortes da Rocha	8	–	–	November - „	- -	2	November - „	
16	John Nicar	3	–	–	November - „	- -	2	November - „	
17	Juan Ascensoa	5	–	–	November - „				
18	Ignacio de Gracio	2	–	1	November - „	- -	5	November - „	
19	Counto de Gracio	–	–	5	November - „				
20	Silvester Lopes	3	–	–	November - „	- -	6	November - „	
21	John Mairan	3	–	4	21 November „	- -	6	End of Dec. „	1
22	Antonio Luis Fortes	4	–	–	End of Nov. „	- -	3	End of Nov. „	1
23	Narcessa Sores	–	–	5	November - „	- -	4	November - „	
24	Antonio de Angesla	5	–	2	November - „	- -	2	November - „	
25	Laurence Santos	–	8	–	November - „	- -	6	November - „	
26	Cebastino Fernandes	7	–	–	November - „	- -	5	November - „	
27	Tertulian Habes	some days			November - „	1	6	November - „	
28	Francisco St. Antonio	some days			November - „	1	4	November - „	
29	Bartholomew da Luz	some days			December - „	14 Dec.	5	December - „	
30	Femino Nazario	10	–	–	December - „	- -	5	December - „	
31	Manoel Domingo	5	–	–	December - „	- -	4	November - „	1
32	Simplicio de Luz	–	–	5	1 December „				
33	Celestina de Luz	some days			December „	26 Dec.			
34	Miguel Nona	5	–	–	5 December „	- -	9	December - „	
35	Raymond Bultaws	4	–	3	December - „	- -	4	End of Dec. „	
36	Serafina de Santos	–	–	5	December - „	- -	6	End of Dec. „	19 Feb.
37	Venino de Rocha	2	6	–	December - „	- -	9	December - „	
38	Manoel Victoriana	–	2	2	December - „	- -	13	Nov. & Dec. „	
39	Seraphina da Rocha	–	–	5	December - „	- -	8	December - „	
40	Anton. Delagar Nasaz	4	–	–	December - „	- -	8	End of Dec. „	
41	Usebio Jose de Silva	8	–	–	December - „				
42	Manoel Anton. Silva	3	3	–	December - „	- -	7	November - „	
43	Joao Latta	–	8	–	December - „	- -	3	December - „	
44	Christophe	5	–	–	December - „	- -	5	End of Dec. „	1
45	Vincente de Noaz	7	–	–	December - „	- -	12	Only 6 in Dec. „	
46	Pedro Goanes	some days			December - „	1	7	December - „	
47	Cosmo Martha	some days			December - „	9 Dec.	6	December - „	
48	John Apollonario	some days			December - „	1			
49	Luiz Santos	–	4	–	December - „	- -	5	December - „	
50	Antonio Fortes Benillo	–	–	5			5	19 December „	
51	Antonio Juan	7	–	–			10	20 December „	
52	John de Nashe	some days			December - „				
53	Des Doas de Nash	some days			December - „				
54	Miguel Jing Jong	some days			December - „				
55	John Fortes Mass	some days			December - „				
56	Dyonisio da Cruz	1	–	–	January - 1846	- -	8	January - 1846	1
57	Jose de Gracia	–	–	5	January - „	- -	3	January - „	
58	Joao Joaquim Perez	5	–	–	January - „				
59	Gregorio Tavares	14	–	–	January - „	- -	4	February - „	
60	Palequino Fernandes	–	–	11	February - „	- -	6	December 1845	
61	Serafina de Rocha	3	3	–	February - „	- -	3	February 1846	
62	Theophilo Gomes, and	2	6	–	September 1845	- -	2	November 1845	
63	John Jamieson, consul's storekeeper		–	–	August - 1846	- -			
	TOTAL	146	65	88		10	277		13

A LIST of the WOMEN of *Boa Vista,* who Washed the Linen of the Officers of the "Eclair;" with the Numbers in their Families, and Results of the Fever, in 1845 and 1846.

No.	NAMES.	When Attacked with Fever.	When Died.	Number in Family.	When Attacked with Fever.	When Died.
1	Menganna Simoa	Nov. 1845	- - -	6	Nov. 1845.	
2	Niece to the above	"	- - -	- -	"	
3	Antonia Chileco	"	- - -	7	"	
4	Mother to the above	"	- - -	- -	"	
5	Mary Leonard	"	- - -	4	"	
6	Delphine Babba	Dec. 1845	- - -	3	Dec. 1845.	
7	Anton. Ketarina	"	- - -	- -	"	
8	Rufina Fernandes	"	- - -	7	"	
9	Amelia de Lima	"	- - -	6	"	
10	Joanna Maria de Graca	"	- - -	5	"	
11	Mother to the above	"	Dec. 1845	—		
12	Anna Maria	"	- - -	3	"	
13	Anna Margarita	"	Dec. 1845	—		
14	Maria de Roche	"	- - -	6	"	
15	Mary Estantina	"	- - -	14	"	
16	Mother to the above	"	Dec. 1845	—		
17	Sabina Diego	"	- - -	3	"	
18	Felicitade de Wash	Jan. 1846	- - -	1	"	
19	Daughter to the above	"	Jan. 1846	—		
		TOTAL	4	65		

ARTILLERY BATTALION of *Cape de Verde.*—4th Battery.

REPORT of the MEN of the said Battery, who have Died in this Island in the Year 1845.

No.	Posts.	NAMES.	Time of Decease.	Where they Died.	Observations.
			1845:		
70	Soldier	Joaquim Alexander Roque	20 September	In the fort	European.
75	Corporal	Joaquim Agostiaho	21 "	- ditto	ditto.
12	Soldier	Luiz Francisco Pimentel	6 November	In barracks	ditto.
26	Soldier	Antonio Lopez	8 "	- ditto	African.
1	Sergeant	José Maria de Moraesclastro	8 "	- ditto	European.
39	Soldier	Francisco da Cunha	8 "	- ditto	ditto.
69	Soldier	Luiz Brexa	12 "	- ditto	ditto.
69	Corporal	Manoel José Alves Guinnaraes	17 "	- ditto	ditto.
24	Soldier	Pedro Goncalves	24 "	- ditto	African.
26	Sergeant	Francisco Antonio Celestino	26 "	- ditto	European.
26	Corporal	Antonio Joaquim	28 "	- ditto	African.

Barracks of Boa Vista,
27 January 1847.

(signed) *Joao Antonio Mascarenhas,*
Brevet Major and Military Commandant.

Washerwomen 7 & 14.

BOA VISTA FEVER.

COPY of Dr. *King's* REPORT on the FEVER
at *Boa Vista.*

(*Dr. Bowring.*)

Ordered, by The House of Commons, *to be Printed,*
10 *March* 1848.

163.

Under 3 *oz.*

BOA VISTA FEVER.

RETURN to an Address of the Honourable The House of Commons,
dated 13 July 1848;—*for*,

"COPY of the LETTER of the Superintendent-General of Quarantine (Sir *William Pym*), to the Lords of the Privy Council, in reply to Dr. *King*'s REPORT upon the *Boa Vista* FEVER said to have been introduced into the Island by the '*Eclair*' Steamer."

Privy Council Office,
18 July 1848.

COPY of a LETTER from Sir *William Pym*, Superintendent-General of Quarantine, to the Lords of the Privy Council, containing Observations upon Dr. *King*'s Report upon the Boa Vista Fever in 1845.

TO THE CLERK OF THE COUNCIL IN WAITING.

Council Office, Whitehall,
15 May 1848.

Sir,

WITH reference to the steamer "Eclair," and the fever which prevailed on board that vessel during the last months of the year 1845, and which afterwards desolated the unfortunate population of the island of Boa Vista, I have the honour to state, for the information of the Lords of Her Majesty's Privy Council, that, since the publication of Dr. M'William's Report upon the origin and progress of that very formidable and fatal disease; the Lords of the Admiralty have been induced to direct another medical officer to proceed to the same station, with the view of obtaining still further information on the subject. The gentleman selected for this service was Dr. King, an Inspector of Naval Hospitals, who, from his former services, ought to have been well qualified for this very important trust. Since his return to England he has given in his Report, which has been printed by order of the House of Commons.

After having most carefully perused this Report, I must candidly confess, that I cannot ascertain that he has added any even the slightest information on the subject, in addition to that furnished by Dr. M'William; on the contrary, I am of opinion, from his want of decision in giving his opinions, that he has still more mystified the subject, and that his conclusions are more likely to confuse and perplex than give information to young surgeons as to the nature and history of yellow fever.

The subject, however, is one of such very great importance, that I consider it my duty, upon the score of humanity, having in view the saving of human life, more particularly on board Her Majesty's ships on the coast of Africa, and in the West Indies, to review this Report, in the hope of pointing out and counteracting the various erroneous statements with which it abounds.

Dr. King begins by stating that, upon his arrival in the island of Boa Vista, on 22d of December 1846, his first object was to ascertain the nature of the fever, and its identity with the disease of the ship (the "Eclair"); that he had seen a few slight cases of fever at Rabil, and five or six in the villages of Gallego and Fundo das Figueras, in all 14 or 15, and for this simple and satisfactory reason, that there did not occur any other examples of the disease on the island during his sojourn of six weeks. He says, "I must admit that the opportunities which were afforded me of judging of the nature of the disease from personal observation were very limited; and I confess also, that none of the patients had the Pathognomonic symptoms of yellow skin, or black vomit; but from the general symptoms in the cases I did see, from the admission of Señor Loao, that the patients I visited in Joao Gallego were the subjects of yellow fever, and from the testimony of all I conversed with, or examined, respecting the symptoms which characterized the disease throughout its course, I am decidedly of opinion that the diseases were identical." It may be asked, what diseases? he has only referred to a few slight cases which he saw in 1846, without any reference to the fever on board the "Eclair," and the only apparent reason he gives for their identity is the absence, in the slight cases which he visited, of the two most remarkable and discriminating symptoms, yellow skin and black vomit.

This opinion is the more remarkable, from the nature of the testimony he called in (apparently having no opinion of his own), for the purpose of enabling him to decide, that the 15 mild cases of fever which he saw without either yellow skin or black vomit, in December 1846 and January 1847, were identical with the cases of malignant fever which raged so generally and fatally on board the "Eclair" and in the island of Boa Vista in the year 1845.

His conclusion, moreover, is inconsistent and contradictory, as he and those who follow the same opinion assert, that the yellow fever is not a disease *sui generis*, but that it is an aggravated type of the common remittent, or that same disease in a highly concentrated form; it is, therefore, most absurd to call those 15 slight cases either the malignant yellow fever, or the highly concentrated remittent.

It is evident, however, from this early wish to prove the identity of the few slight cases of fever which he did see with the malignant fever on board the "Eclair" which he did not not see, that he had an ulterior object in view, viz. that he might call in the circumstance to his assistance in his future attempt to ascertain the origin of the disease in the island, by proving that it was indigenous, and unconnected with the "Eclair." It must, however, be particularly kept in view, that the few cases of fever which Dr. King did see, existed in the end of December 1846 or beginning of January 1847, nearly 18 months after the first commencement of the fever in the ship. It must be noticed, also, that he arrived at the island of Boa Vista towards the end of the annual sickly season; and, instead of seeing malignant yellow fever, he saw, during his residence of six weeks, only 15 slight cases of fever, peculiar to that season, proving the very healthy state of the island.

I may further observe, that Dr. King, in entering upon the subject of the identity of the few cases then existing in the island (that is in the years 1846 and 1847), is wandering from his Instructions, which had nothing to do with the fever of those years, or with their identity with any other disease. He was directed to proceed to Boa Vista for the purpose of ascertaining whether there were any circumstances from which it might be inferred that the fever which prevailed in Boa Vista in the year 1845 was an indigenous production, or that it originated in causes unconnected with the "Eclair," and to be very particular in his inquiry as to the state of the weather (as related by the Governor-General of the Cape de Verds and the British Consul) previously to the commencement of the fever (in 1845), showing clearly that his mission had reference altogether to this last year: Dr. King, however, regardless of his instructions, starts at once with a determination to make it appear that the fever of that year was the fever of the season, aggravated by circumstances, and the sole object throughout his Report is to carry out this impression with the view of counteracting the conclusions come to by Dr. M'William; but in this attempt, whatever his instructions may have been, he has most signally failed.

Dr. King's object, no doubt, is to keep up the delusion as to the vomito negro, or Bulam fever, and the marsh remittent, being the same disease. It is, therefore, of the utmost importance, for the information of persons unacquainted with the nature of the two diseases, that a line of demarkation should be drawn, with the view of establishing their separate and distinct existence.

The remittent fever originates, or is produced, in situations connected with miasmata or malaria, and is not infectious; it is attended with distinct remissions and exacerbations; it rarely, if ever, has the black vomit symptom; persons who have had one attack are very liable to a second; it prevails as an endemic along the whole line of the coast of Western Africa, at all times and seasons of the year; at Boa Vista (as in many situations in Europe) it is a disease of season only, and in this island its prevalence is generally limited to the Rabil Ravine; its period of arrival and departure are well known, and, as stated by Dr. Almeida,* it never appears at Boa Vista before September or October, and always takes its departure in the course of the months of January or February. It is well known in India as the jungle fever; the Bulam or vomito negro fever is unknown there.

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* A physician who had been 37 years on the island.

The other disease is a very different one; it is in no way connected with malaria or unhealthy situations; it is unknown in the East Indies, in Egypt or in Turkey, and is a native of and peculiar to West Africa (making its appearance only occasionally on the coast), as the Pestis Bubonica is to Turkey and Egypt.

1st. It is a disease *sui generis,* known by the name of African, Yellow or Bulam Fever, and is the Vomito Pietro of the Spaniards; it is attended with the peculiar and fatal symptoms of black vomit.

2d. It is highly infectious.

3d. Its infectious powers are increased by heat, and destroyed by a certain degree of cold.

4th. It attacks natives of a warm climate in a comparatively mild form.

5th. It has also a singular and peculiar character, viz. that, like small-pox, it attacks the human frame but once.

This disease has been at various times imported into different countries, viz. to the different West India Islands, the Islands of Ascension and Bermuda, and into different ports of Spain and North America, as in the year 1845 into the island of Boa Vista.

It may exist, in consequence of importation, throughout the whole year in warm climates; in temperate climates, however, its prevalence is confined to the summer months, its infectious powers being destroyed by a certain degree of cold.

Dr. King says, "The second object I proposed to myself was, to trace, in the shortest time allowed me, the connexion between the fever on shore and the disease of the ship:" this he endeavoured to do by going over the same ground and following the same course (but by a shorter road) which had been taken by Dr. M'William, viz. the examination of the labourers who had been employed on board the "Eclair;" the principal queries put to them were: "How many days were you employed on board? When were you attacked with fever?" By those queries his object was to ascertain whether the disease became manifest in any of those persons within a sufficiently brief space of time to lead to the conclusion that the fever was derived from the sick of the "Eclair." And here it is necessary to explain that the labourers had no communication with the "Eclair" until some days after the sick had been removed to a fort on a small island near to Boa Vista, and after the vessel had been fumigated and whitewashed by the Kroomen; add to which, she was at anchor, and constantly exposed to the fresh trade wind; there was therefore very little risk of infection from this empty and well-purified vessel; nor does it appear that there was more than one instance of the disease having been communicated to a labourer by the sick; this was in the case of Louis Pathi, who had been on board the "Eclair" the day that the crew re-embarked, and assisted them in getting on board. The history of Louis Pathi, from Dr. M'William's queries, is as follows: "I was on board the 'Eclair' when the sick were brought from the island the day she sailed: I went to my own house at Rabil the day I returned from the ship; the next day I paid a visit to a friend at Moradinha, where a festa was held; there I was taken ill, in about three days after I left the ship; I remained there eight days sick with general fever, head-ache, pain of back and limbs, and very sick; at the end of eight days I was carried to my house at Cabeçada, and continued ill nearly three weeks: I had a wife and three children; they all died of fever; my daughter, 12 years of age, was first attacked after me, in the beginning of October; she was only three days ill; she had burning fever, and for some hours before she died vomiting of black stuff, and delirium; another girl, six years old, was attacked four days after her sister, and died in the same way; my boy, eleven years old, was attacked eight days after the second girl; he lived only five days; my wife was taken ill on the same day as the last of the children; she lived 15 days, and died with black vomit."

The history of this family is a very convincing proof of the communication of the fever to a village, in the centre of which was Pathi's habitation; the adjoining dwellings were those of Manoel Fachina, Joaquim Pathi and Manoel Rosa. The first family attacked after that of Pathi was Manoel Fachina's; this man had been employed in one of the launches attending upon the "Eclair;" his wife, who had been a good deal in the house of their neighbours, the Pathis, was shortly afterwards attacked with fever, as were also his two children, and, lastly, himself; one child died after three days' illness; the other recovered; Joaquim Pathi, a cousin of Louis Pathi, who had also been a labourer on board the "Eclair," was attacked shortly after his cousin, whose family he had visited; the fever ran through all the members of Joaquim's family, and all recovered.

This completes a clear and palpable chain of evidence, connecting, as cause and effect, the fever of the ship with the epidemy on shore.

This history of the Pathi family and their neighbours ought to satisfy the most fastidious as to the infectious nature of the fever.

Dr. King, page 3, says, "The last object I had in view was to learn from what cause or causes the disease originated in the island, and to ascertain the manner of its propagation among the inhabitants." The last part of his object, it appears, he had already ascertained, as he states, page 1, "Dr. M'William's documents exhibit, with great minuteness and circumstantially the communication of the fever from one person to another in different parts of the island." He has admitted that the fever did not exist at the island of Boa Vista before the arrival of the "Eclair," in August 1845.

In his reply to query 3, "Did the fever originate in the island?" Dr. King says, "All with whom I conversed (except Dr. Almeida) insist on it as a fact not to be doubted, that the fever was imported by Her Majesty's steamer 'Eclair.'" In reply to query 4, "Is there any proof of its being of a contagious nature, or data to lead to a contrary conclusion?" he says, "It is universally believed by the inhabitants to be of a contagious nature; but, excepting the unfortunate arrival of the 'Eclair,' with fever on board previously to its breaking out on shore, I have learned nothing to lead to that conclusion; on the contrary, I shall be able to adduce various facts, which I think will amount to strong presumptive proof that the disease originated in the island."

What more does Dr. King wish to learn? The unfortunate arrival of the "Eclair" with fever on board is the sole cause adduced for the introduction of the disease into the island; he has most unaccountably acknowledged the identity of the fever on shore with that which prevailed on board; and he admits, page 5, that the disease became manifest in one labourer, Louis Pathi, within a sufficient time to lead to the conclusion that his illness was derived from communication with the sick of the "Eclair." He admits, also, that two of three soldiers on guard in the fort were attacked with fever resembling that which prevailed on board, and that both died within a week after the departure of the "Eclair:" he says, "If the testimony of the people themselves is to be considered exclusively as evidence of the contagious nature of the fever, then I must admit (as they are all contagionists) the conclusion is inevitable, "that the disease was introduced by the ship, and was communicated in the same manner from one person to another in the island." He then asks, "Is this highly important question, then, to be decided, in the absence of all recorded or documentary evidence, by the oral testimony alone of persons in the lowest condition of civilized life, who are ignorant and uneducated, and who are always sadly perplexed when referring to dates and particulars of memorable occurrences even in their own families?"

Dr. King, however, had no such despicable opinion of the population when obtaining evidence from them; for in page 2, as to the identity of the disease, where he says, "From the testimony of all I conversed with or examined respecting the symptoms which characterized the disease throughout its course, I am decidedly of opinion that the diseases were identical;" upon this question the inhabitants were well informed, sensible people, with good memories, but not so upon the question of contagion.

He says again, page 4, "I am bound to state my opinion candidly, that it does not appear to me at all probable that fever was contracted by the labourers, except in one instance, even from the malaria, which certainly existed at that time on board the ship; and it is still more improbable that the disease arose from a specific contagion emanating from the bodies of the sick, because I am fully persuaded that the labourers were not exposed to the influence of such a cause even if it had existed." As to the labourers not having been exposed, Louis Pathi states, in his examination, that he was with the sick on board the ship the day they were embarked, and his name appears as the very first man on the list of labourers examined by Dr. King, and he ought from him to have ascertained the fact; but, still incredulous as to the cause of the fever, he says, "Allowing that the majority of the people employed had direct communication with the sick on board and at the fort, where is the proof of contagion? is there a clear and palpable chain of evidence connecting as cause and effect the fever of the ship with the epidemy on shore, or, in other words, were they thus exposed to a presumed specific contagion at its source, where it might be considered to exist in its highest degree of concentration, infected with the fever in its worst form, and within a reasonable space of time, and was the disease in the same manner transmitted to their families?" this question has been already pretty satisfactorily answered by the history of the unfortunate family of the Pathis; but, to reply still more fully to all his inquiries, I shall give the history of the soldiers in the fort, where the specific contagion was at its source, and where the soldiers were infected with fever in its worst form, within a reasonable time, and transmitted to their families.

It has been stated, and assented to by Dr. King, that of three soldiers who composed the guard when the sick of the "Eclair" were in the fort, two of them, a corporal and private, were attacked on the 14th September, the day after the "Eclair" sailed, with fever of the same nature as that which prevailed on board the vessel: their history, as given by their surviving comrade (Miguel Barbosa), is as follows:

The corporal was taken ill the day after the steamer sailed; the private (Roque) was attacked on the same day as the corporal; the corporal died on the 3d day of his illness, and Roque on the 4th; they had general fever, delirium and black vomit. Pedro Manoel, another private, who had been sent by the commandant as nurse, to attend the two sick men when first taken ill, stated, that he had been with them three days before they died; that he remained in the fort four days after, during which time he was not well; and the commandant, fearing that his comrade, Miguel Barbosa and himself, might have fever, did not allow them to return to the barracks, but sent them to a small house in Pao da Varella, where they remained seven or eight days, when they went into barracks. While they remained in the small house they were visited by a great many persons, in particular by Anna Gailinha, a Portuguese, who cooked for them, and by another woman, Manoel Joana, who was constantly in the house.

Antonio Alves, a private soldier, who was ordered to bury the bodies of the two soldiers who died in the fort, is a link in the chain connecting the fever in the fort with that in the town: he says, "I was sent by the commandant to bury the body of the corporal: I was assisted by Joaquim Foranga and Manoel Luis, privates; they accompanied me in the boat from Porto Sal Rey to the island; I took off my clothes, and ran up to the fort in a state of nudity; there I saw two soldiers on duty; the corporal was dead; the private, Roque, very nearly dead; the two men on duty, Pedro Manoel and Miguel Barbosa, assisted me in rolling up the body in a quilt; in this way we carried it to the boat, and buried it in the sand on the beach. Roque died the next day; I also buried his body, assisted in the same way by the same two soldiers; I then returned to Porto Sal Rey, where I remained only about an hour, the commandant having ordered me back to the fort as a guard; I was accompanied by Lorenzo Samed and Pedro Gonzales, privates, but I only remained on this guard a day and a half, having been taken ill; my comrades hoisted a signal to that effect, whereupon the barrack boat was sent, and took me to the barracks; I was ill four or five days; I was very weak a much longer time; I do not know how long my two comrades remained in the fort; but they were both taken with fever, and Pedro Gonzales died."

This evidence proves, first, the communication of Louis Pathi with the sick on board the "Eclair" on the day of her sailing; it proves his own (not very slight)

slight) attack of fever three days after he left the ship; it proves the communication of fever by him, first to his children and wife, next to his visitors and neighbours, and, in fact, to the villages.

The history of the guard in the fort proves most clearly the introduction of the fever into the town of Pao da Varella by the soldiers who attended and buried the corporal and private who died in the fort within a week after the departure of the "Eclair;" it proves that the first persons taken ill in the town occupied the same house or that adjoining the soldiers who had been sent to the village, under observation by the commandant, he being apprehensive of the disease being introduced into the barracks. Dr. King acknowledges that Anna Gallinha, the woman who lived in the same house, and cooked for the soldiers, was the first person that died in the town, having been taken ill on the 12th, and died on the 16th October with black vomit; so that we have a double inoculation of the island, first, of the villages by Pathi's family, and next of the principal town by the soldiers from the fort; and although the woman Anna Gallinha's death was the first that created alarm, it is clear that the fever had established itself on shore some time before, as Dr. Almeida states, in his examination, that when he heard of the appearance of the disease in the town, he went there on the 19th or 20th of October, when he found about 20 persons sick.

Dr. King says, page 6, with reference to the sickness and mortality amongst the soldiers, that two, a corporal and a private in the fort, were attacked with a fever resembling that which prevailed on board the ship, and both died after an illness of five or six days; and, in explanation, he says, "To those who assert that the yellow fever is highly infectious, and in no way connected with malaria or unhealthy situations, it will be of no avail to point out that both men were preeminently exposed to the attack of endemic fever, as they were Europeans, and had but lately arrived in the colony; but at any rate none of the soldiers were ever on board the 'Eclair,' and I have no reason for believing that any of them were permitted to enter the sick apartments at the fort."

It is only necessary to state, in reply to the first assertion, that the soldiers had not lately arrived, having been on the island more than 12 months, that is, from the month of August 1844; and as to endemic fever, there was nothing of the kind on the island of Boa Vista at the time, and there was less chance of its existence upon the dry and barren rock on which they were quartered; and so far from the soldiers not having been permitted to enter the sick apartments, it appears that they were very constantly in communication with the sick; and if Dr. King had looked more to the soldiers of the fort (for he seems to have examined Miguel Barbosa only, who was one of the first taken ill), he would very soon have come to the same honest conclusion as Dr. M'William.

Antonio dos Santos, one of the guard, being asked whether he and his comrades mixed with the sick, he replied, "Yes, always; we saw several die;" and Vincente da Cruz, another of the guard, being asked the same question, replied, "Yes, we mixed freely with the sick;" and Dr. King, after having stated, in reply to query 6, "that the inhabitants in general were firmly persuaded that the fever was imported by the 'Eclair,' and afterwards spread throughout the island (by contagion) from one person to another," says, "I have taken considerable pains to trace out the supposed concatenation, but in vain; it becomes, therefore, a duty to express my opinion decidedly, that there is no satisfactory proof of the disease having been propagated by contagion, or from a specific poison which is said to emanate from the bodies of the sick, the dying or the dead."

In reply to query 9, "Is there any proof of the same disease having broken out in any other parts of the island where the inhabitants could have had no communication, direct or indirect, with the 'Eclair,'" Dr. King says, "The same disease broke out at the end of October in the villages of Joaõ Gallego, Fundas das Figueiras and Cabeça dos Taraffes, on the eastern side of the island, 16 miles from Porto Sal Rey. The above facts were communicated to me by the judge of the Old Town."

No doubt the fever did break out at all those places, but it was at a time when the fever was general in the principal town, and in some of the villages, and the introduction of the fever into those places was in every instance clearly traced to the arrival of an individual from an infected place, who was either suffering from the fever at the time of arrival, or who was attacked very soon afterwards, and communicated the disease first to the inmates of the house, next to the visitors, and gradually to the whole of the inhabitants.

At Cabeça das Taraffes the first person taken ill was Anicetta, daughter of the master of a sloop, who had been living in a house where there was fever, and was attacked the day after her arrival; her mother and sister, and afterwards her neighbours, were attacked in succession.

The village Joao Gallego was perfectly healthy on the 1st of November, when two soldiers arrived from the barracks in Porto Sal Rey (where the fever was raging) to the houses of their relations; they were both taken ill soon after their arrival; the mother of one was attacked, and died, and three others of the same family were taken ill about the same time, and all died; so that the information received from the judge agrees with Dr. M'William's Report, excepting that portion of it, and the most important, as to the arrival of individuals from infected places, which has been suppressed by Dr. King, and, still looking to the "Eclair," he says, "it may not be inappropriate to mention some of the particulars respecting the fever in Estacia (Old Town), where there must have been some communication with the ship, as some of the labourers who had been employed on board resided there."

"The fever did not appear in this town until after the middle of November; two months at least after the 'Eclair's' departure." If Dr. King had executed his commission with half the zeal and search after truth as Dr. M'William, he would have been informed as follows:

At Estacia the origin of the disease was distinctly referable to the arrival of a young man, Joao Chico Fernandez, and his sister, in a sickly state, from Rabil, where the fever was raging: from the house in which these two persons were lodged, and from that occupied by a man called Justinian da Silva Britto, who about the same time came from Porto Sal Rey, the fever spread over the whole of the village; Justinian da Britto died on the 24th November; his brother, Fortunato, who had nursed him, was attacked in eight days after, while at Porto Sal Rey, where he died: another brother, Luis, went to St. Estacia some time before Justinian's death; he, too, was taken ill, and died on the 13th December: the whole of a family, amounting to six children, of a man called Simao Antonio, who lived near Chico Fernandez, and had visited him and his sister, were at this time seized and swept off by fever; in fact, as stated by Dr. M'William, the disease in every village first appeared in a single house, which became a focus for its dispersion throughout the population.

It would appear, from Dr. King's queries and statements, that he had only one instruction, viz. to prove that the fever on shore was unconnected with the ship, and that it had its origin from local causes, malaria or marsh miasmata; hence his opinion as to the mild cases he saw having been identical with the malignant fever; he seems inclined to overlook the soldiers in the fort, who were much more exposed to the influence of contagion than the labourers; these last were not in any way exposed, and certainly had no communication with the sick until they were re-embarked, and on the very day the vessel sailed.

It is known that as soon as the sick were removed from the "Eclair" to the small island, operations for clearing out the hold, and fumigating and whitewashing the vessel, were commenced by the Kroomen, and that the labourers were not employed upon her in any way until those operations were completed, so that it was hardly to be expected that any labourer could have suffered after all this cleansing and fumigation, the vessel being all this time at anchor, and exposed to the fresh trade wind; add to this, that the labourers entertained the greatest dread of the fever; so much so, that most of them declined going between decks.

Dr. King, in commencing Part 2 of his Report, says, "Having failed in my endeavour to trace out the unbroken chain of connexion between the disease on board the 'Eclair' and the fever of the island, and its propagation among the inhabitants by contagion, I must revert to the facts and circumstances relating to the fever among the crew of the ship at Sherbro', Sierra Leone, and at the fort on the small island near Boa Vista, as it is absolutely necessary to learn when and where a new and specific disease was introduced, or how and under what circumstances the bilious remittent of the coast became a contagious disease; for it is unquestionable, that after the 'Eclair' left Sierra Leone, fever again broke out, and in a more aggravated form."

And here, before attempting any explanation, it will be necessary for me to give a short statement relative to the history of the vessel from the period of her sailing from England.

The "Eclair" quitted Plymouth on 2d of November 1844, for the west coast of Africa; she reached the island of Ascension on the 30th of the month, where she remained until the 7th December, when she took her departure, and arrived at the River Gaboon on the 20th; she then steamed across the Bights of Benin and Beafra, and, continuing her course along the coast, arrived at Sherbro' on the 18th January; from this time she was sometimes under weigh, and sometimes at anchor, and having touched at Sierra Leone for four days, steamed from thence on the 28th February, and on the 2d March anchored in her position of Scabar.

The crew had continued healthy from the 20th December (the date of their arrival on the coast) to the 3d of April, when the first severe case of fever appeared, and cases continued afterwards to occur until the 5th June, which was the date of the last person being attacked, while the ship remained at Sherbro' (the sickly station on the coast), and during which period 10 deaths occurred.

It is universally allowed that this Sherbro' fever, the whole of the cases (with two exceptions) having occurred exclusively amongst the men who were employed in the boats, was the remittent, which is not a contagious disease; there was no mention of the vomito negro symptom in any one case, nor did the disease extend amongst the men who remained on board.

It has been stated, that the last case of fever which occurred at Sherbro' was on the 5th June; from this date until the 22d July (47 days, including 18 days that the vessel remained at anchor at Sierra Leone), the crew continued healthy, the "Eclair" having arrived at Sierra Leone on the 4th July.

Dr. King says, "The arrival of the 'Eclair' at Sierra Leone in a healthy state is quite incompatible with the idea that the previous fever was contagious. It is not hinted that the sailors were exposed to infection from persons labouring under the disease when on shore at Sierra Leone; indeed it is not certain that there was a single case of sporadic yellow fever in the town previous to their arrival. I am at a loss, therefore, to understand how its origin can be explained on the principle of contagion."

This certainly requires to be explained, and which I hope to do most satisfactorily.

The fever which attacked that portion of the ship's company who were employed on boat and river duties when off Sherbro', was, as Dr. King has stated, the remittent, and not contagious, and undoubtedly the consequence of malaria; it ceased with the boat duties on the 5th of June.

And as to it not having been hinted that the sailors were exposed to infection from persons labouring under the disease, this no doubt is true, and for the best of all reasons, viz. from the impossibility at the time of ascertaining the fact; the medical men on board the "Eclair," it is evident, could not give the information, as they knew nothing of the nature of the disease; even after they saw it, they, as they had been brought up in the school of non-contagion, took it for granted, that it was the aggravated or concentrated marsh remittent.

The difficulty, however, has been solved; as it has since been clearly ascertained that the infectious vomito negro fever actually existed on shore at Sierra Leone, when the "Eclair" was at anchor there, and for this fact I have the best authority; viz. that of Dr. Aitkin, the colonial surgeon at Sierra Leone, and Captain Harsten, R.N., who was then first lieutenant of the ship.

Dr. Aitkin stated to me, in a letter dated 11th February 1848, that the yellow or Bulam fever prevailed in Sierra Leone in 1845 (but to a limited extent): "As far as I can recollect," he says, " the 'Eclair' steamer was then in harbour; at that time there were three deaths from decided cases of black vomit: Mr. Pringle a merchant, Mr. Babbage an American captain, and the third a seaman treated in the military hospital. I have been a constant resident in Sierra Leone for 16 years, and never met this fever but in the years 1837 and 1838; I am decidedly of opinion that it is a very different disease from the bilious remittent or country fever, which prevails every year and at all seasons, this last having distinct remissions and exacerbations, which the Bulam has not."

Captain Harston replied to me by letter, in a very few words, as follows: "The fever was in the town of Sierra Leone when the 'Eclair' was in the harbour; Mr. Dawson, the passenger, embarked ill, and died with black vomit."

This is a convincing proof that the fever which made its appearance amongst the crew, upon the departure of the ship from Sierra Leone, was a new and a very different disease, which spread most rapidly and unsparingly throughout the ship. This is acknowledged by Dr. King, page 11; he says, "The 'Eclair' left Sierra Leone on the 23d July, and arrived at the Gambia on the 10th of August; in that short time, however, several men, chiefly those who remained on shore at Sierra Leone, were carried off by fever, some of them with black vomit."

It has been asked, if this vomito negro fever be really endemic in the coast of Africa, we ought to hear more of it, considering the large squadron which is now kept there.

This is not the place to enter into a history of this disease; I may shortly, however, state, that it is not (in the sense of the word) an endemic of the African coast; and although a native of and peculiar to West Africa, it is a rare disease even at Sierra Leone, or other parts of the coast. I may mention, however, the following years in which it did prevail, viz. in 1823 extending to 1824, 1829 extending to 1830, 1837 extending to 1838; and if the records of the medical department of the navy are examined, it will be found that, with the exception of the years mentioned, the crews on board the ships on the African station were comparatively healthy, and that the few ships which did suffer from this vomito negro fever were those which had been directly infected at Sierra Leone, or which had communicated with the ships so infected; in proof of which, I may mention the "Bann" sloop of war, which was infected at Sierra Leone in the year 1823; she proceeded from thence, with the fever raging on board, to the island of Ascension, where she communicated the disease to the marines forming the garrison, as well as to the crew of the "Driver" sloop of war. The "Bann," out of a crew of 130 men, lost 38, and of the marines forming the garrison (36 in number), 17 died; the "Driver" having put to sea, only eight of her crew were attacked, of which number three died.

In the year 1829 the "Eden," which had been nearly two years on the African station, during which time her crew had been comparatively healthy, touched at Sierra Leone on the 1st of May, all on board being then in good health; but malignant fever prevailed at this time on board the merchant vessels, and on shore. A midshipman suffering from this fever on board a prize was removed into the "Eden" on the 5th May, and died on the 6th; she sailed on the 20th, having had during the intermediate period 18 cases of fever; the "Eden" arrived at Fernando Po on the 11th of June, having lost altogether from fever in officers and men 25 individuals. Before the arrival of the "Eden" at Fernando Po, the colony enjoyed (comparatively speaking) good health, but immediately afterwards fever appeared; that is, in the course of the month of June, and before the 31st of August, 77 persons on shore were laid prostrate by the disease, of which number 39 died.

The "Eden" during 1829–30 lost 140 men; the "Sybille" during the same period, lost 96.

Having given those examples of the appearance of vomito negro fever on the coast, and of its introduction first into Ascension, and next into Fernando Po, I shall now take six years, 1831 to 1836, both years included; a period which has been described as almost devoid of medical interest, from the comparatively small number of deaths amongst the crews in the whole of the African squadron.

The African squadron consisted—

In the year 1831	of 7 sail	and lost 22
,, 1832	of 8 ,,	,, 18
,, 1833	of 13 ,,	,, 12
,, 1834	of 13 ,,	,, 18
,, 1835	of 15 ,,	,, 19
,, 1836	of 18 ,,	,, 16
	74	105 total deaths in six years.

Any person comparing the number of deaths in those six years in the whole squadron, when the contagious disease was not present, with the mortality which occurred on board the " Eden " and " Sybille," must be convinced of the existence of two very different diseases, the one a constant resident on the coast, the other a rare and most unwelcome visitor.

I think it necessary to make some observations upon Dr. King's description of the fort on the small island, which was fixed upon as an hospital for the sick of the " Eclair : " he says, " I visited the fort on the 16th January 1847. I was immediately struck with the tokens of neglect and decay visible in every part of the building; but had the whole been in good repair, it did not appear to me at all capable of giving proper accommodation even to 50 men, and yet in this place were huddled together more than 100 men of the 'Eclair;' many of them were doubtless in an ordinary state of health, but several were labouring under malignant fever :" he goes on with a description of the interior, any thing but flattering or creditable to the arrangements of his brother officers : however, with reference to the 100 men being huddled together in this place, and in defence of Captain Estcourt's arrangements, I shall give a short extract from his letter of the 8th September to the Commodore on the station : he says, " Following the unanimous advice of the medical men and others resident here, I landed all the crew, placing those under the cover of tents who were well, and the sick in good airy rooms ;" so that the crew, instead of being huddled together, as described, the sick only were in the rooms which Captain Estcourt described as airy (and it appears from Dr. M'William's plan of the fort, that one room, 16 feet square, had four windows and two doors). Dr. King asserts, from the day the crew were landed at the fort until they were re-embarked, 37 cases of an aggravated type occurred, 25 of which proved fatal : but, he says, " Does it necessarily follow from the aggravated character of the fever, and the great mortality at this place, that the disease was, or had then become, contagious ? I believe not." This very laconic and decided opinion proves the melancholy results which may and do occur in consequence of medical men being ignorant of the real nature of the disease ; this superstition, it may be called, as to yellow or vomito negro fever being only a higher grade or aggravated type of the remittent, which is not contagious, prevents the necessary precautions being taken against its being communicated from ship to ship, or by the crew of a ship to the population on shore, and is consequently the cause of a great loss of human life, and, as an example, it is only necessary to look to the present instance of the arrival of the " Eclair " at Boa Vista. The captain, apparently aware of the contagious nature of the fever, hoisted the yellow flag, and placed himself under quarantine until the authorities on shore had ascertained the nature of the disease which prevailed on board : in consequence, however, of the misrepresentation by the medical officers belonging to the ship, they declaring that it was the common fever of the coast, the " Eclair " was admitted to free communication with the shore; hence the melancholy results to the population. Sir William Burnett, chief of the medical department of the navy, who unfortunately espouses this mistaken theory, ought long before this time to have acquired better information on the subject from his own Report upon this same disease on board the " Bann " sloop of war, when he acknowledged it to be a contagious disease, and that it had been communicated to the garrison of Ascension by the crew of that vessel. He ought, from a late publication upon diseases of the African coast, by himself and Dr. Bryson, to have acquired still more information as to the nature of the disease, as they give several strong and convincing proofs of its highly contagious character, particularly in the " Eden " and the " Sybille " at Fernando Po, in the year 1829, and still later, in the case of the arrival of the " Ætna," " Bonetta," and " Forester,"

" Forester," at Ascension, in the year 1838, their crews suffering from yellow fever, when the disease was again introduced into that island.

If the medical men on board the ships at Boa Vista had known the nature of the " Eclair " fever, they would, in the first instance, have objected to the crew being landed; but not having done so, they ought, when they were landed, to have established the same or more rigid precautions than they would have done if the disease had been plague; they ought immediately to have cut off communication between the sick and the healthy; and to one most important point I must call attention, and strongly recommend, viz. the employment (as nurses) of the convalescents and others who had already passed the disease; the great advantages derived from this arrangement were most remarkable during the prevalence of yellow fever at Gibraltar in the year 1828, when out of 164 persons employed as nurses and orderly men, in the military hospitals, who had not had the fever, 141 were attacked; and of 61 other persons employed in the same duties who had, with the exception of two, passed the fever at some former period, all escaped it, excepting the two who had not had it before.

Dr. King having apparently assented to the statements made, and conclusions come to by Dr. M'William, begins to argue against his own conviction, for he says, in reply to query 2, " Assuming for the present that there is no direct or satisfactory evidence of the fever having been communicated to the inhabitants by the 'Eclair,' I shall notice, very briefly, a few circumstances from which it may be reasonably inferred that the disease was an indigenous production, and that it originated in causes unconnected with the 'Eclair.' " He says, in reply to query 4, " I trust I shall be able to adduce various facts, which, I think, will amount to strong presumptive proof that the disease originated in the island."

To effect this he appears, however, in considerable difficulty, as all his reasonably inferred evidence, and his strong presumptive proof, are contained in the following paragraph, p. 8, " The situation of Porto Sal Rey, and the whole district of Rabil, in the immediate neighbourhood of swamps and pools of stagnant water, and the patches of rich alluvial soil near the other villages, expose the inhabitants to these noxious exhalations during the autumnal months, which are generally admitted to be the common remote cause of fever." This is the whole of the evidence attempted to be brought forward in favour of local origin, and he is certainly most unfortunate in his choice of Porto Sal Rey for a sickly quarter, as, according to Dr. Almeida, it is considered a convalescent station, as he stated in his examination, that he had never known a case of either remittent or intermittent fever to have originated there, but, on the contrary, that persons suffering from those diseases in other places came there for recovery; and after giving this presumptive proof of the fever having originated in the island, he says, page 5: " It would be out of place were I now to enumerate the various facts in my possession, which afford strong evidence that the disease originated in a vitiated or malarious state of the atmosphere."

Why Dr. King should decline bringing forward those various facts is most unaccountable; the chief and only object of his mission was to prove their existence, but they certainly have not appeared throughout the body of his Report. It is evident that he is totally at a loss for evidence in favour of the fever on the island having been occasioned by local origin, and, giving up the attempt as a complete failure, he turns upon the " Eclair," in the hope (without orders and quite contrary to his instructions) to endeavour to ascertain the cause or causes of fever on board that ship. He begins by calling in to his assistance a supposed malaria; he says, " I am bound to state my opinion candidly, that it did not appear to me that fever was contracted by the labourers, except in one instance, from the malaria which certainly existed at that time in the vessel." And at page 10, " I am inclined to believe, from the information I received, that the holds of the 'Eclair' were in a bad condition, and from the melancholy history of the progress of the disease on board subsequently, during a period of six months, that the operation of a morbific cause of a miasmatic nature in the ship itself was there first manifested."

To counteract all this, it is necessary, in the first place, to correct this statement as to the existence of the fever on board the " Eclair " during a period of six months.

The

The crew of the "Eclair" were all healthy on the 5th of June, and continued so until the 23d of July (47 days), when the first case of fever appeared, and it is well known that the last case occurred at Standgate Creek, on the 11th of October, including a period of not quite three months; and it may be asked as to the supposed morbific cause existing in the ship, what became of it during those 47 days even while the vessel was at anchor in the harbour of Sierra Leone? and as to the holds of the "Eclair," they were examined upon her arrival at Boa Vista, when they were found to be perfectly clean, and this is acknowledged to have been the case by Dr. King himself, at page 12.

But Dr. King, still finding himself in difficulty as to the origin of the disease in the "Eclair," abandons his strong hold of malaria, and returns to Sierra Leone, where, he says, "had there been nothing more remarkable in the history of the disease on board the 'Eclair' than the death of a considerable number of men shortly after leaving that place, the cause of their illness would have been easily and satisfactorily accounted for; they had been exposed under the most unfavourable circumstances to the influence of causes peculiar to the country which produced the disease, and at a season when few Europeans lately arrived escape an attack of the endemic fever, and where, from local aggravations, fever of a malignant type might be expected. They wandered in the streets drenched with rain, and committed excesses in the lowest haunts in the worst and most unhealthy parts of the town." This is a strange digression, and quite unconnected with his instructions, which had reference only to the origin of the fever on the island of Boa Vista in 1845, and, having failed in all attempts with malaria, pestilential atmosphere, marshes and ponds, to originate the disease in the island, he has at length and unknowingly hit upon the right cause, the "Eclair;" the crew of this vessel having been infected at that station (Sierra Leone), not from their irregularities, but from the sailors having been exposed to infection, from persons actually labouring under the vomito negro fever.

Dr. King says, page 11, "It is not certain that there was a single case of sporadic yellow fever in the town previous to the arrival of the "Eclair:" this is rather begging the question on his part: as he has visited that settlement since the time of the "Eclair," he may, in all probability, have ascertained the fact; and the case of Mr. Dawson, the passenger who went on board ill on the 23d of July, and died on the fourth day of the fever, with the black vomit symptom, is an undoubted proof of it. It has been stated before, that the "Eclair" left Sierra Leone on the 23d of July, having only one seaman on the sick list with fever; this man died, and was the first case of black vomit which had appeared since their arrival on the coast: from this time the disease spread most unsparingly throughout the ship, the vomito negro having been a common symptom in most of the fatal cases even until her arrival in England.

With reference to Dr. King's supposed cause of the origin of the fever, viz. the excesses committed by the sailors, their wandering about the streets drenched with rain, and their visiting the lowest and depraved parts of the town at Sierra Leone,—this surely could have nothing to do with the production of yellow fever!! if it had, how is the attack of the officers to be accounted for, more particularly of his own medical colleagues, who suffered in the greatest proportion: it may be asked, was it by contagion?

It has been matter of surprise, after the very satisfactory report presented by Dr. M'William, upon the "Eclair" and Boa Vista fever, that the Lords of the Admiralty should have been induced to send another medical officer upon the same mission; it now, however, appears evident that it was done with the view of satisfying Sir William Burnett as to one point upon which he laid much stress, as the great cause of the fever, viz. a certain supposed state of the weather at Boa Vista before the appearance of fever in the island, and which, in his opinion, ought to have been noticed by Dr. M'William.

To explain this, I must be under the necessity of referring to the presentation of Dr. M'William's report to the Lords of the Admiralty by Sir William Burnett.

He says, "I beg to lay the same before their Lordships, together with extracts of letters from the Governor-General of the Cape de Verds, the British Consul, and Mr. Macaulay, distinctly showing the very remarkable state of the weather preceding the attack of the inhabitants of the island (which very important circumstance, I regret to observe, Dr. M'William has omitted to take any notice of), which attacks did not appear to have taken place till a month after the departure of the "Eclair." Dr. M'William appears to have taken considerable pains to gain information; but, after a careful perusal of his papers, I am compelled to say that I cannot conscientiously arrive at the conclusions the Doctor has done, viz. that the fever was occasioned by the 'Eclair.'"

One conclusion, however, which Sir William Burnett has come to (a very mistaken one), must be corrected, viz. that the attacks of fever which took place amongst the inhabitants of Boa Vista, did not occur till a month after the departure of the "Eclair." It would really appear that he had not read Dr. M'William's Report; he might have said that the fever did not prevail to any extent on the island until a month after the departure of the "Eclair;" but there can be no doubt of the first cases of fever, viz. Luis Pathi, and the soldiers in the fort, having appeared within one week after her departure; and, allowing for a certain number of days of incubation before the appearance of the fever in persons after having been infected, it could not have been expected to prevail generally in a shorter period than a fortnight or three weeks; and, on reference to Sir William Burnett's own history of the introduction of the same disease into the island of Ascension by the "Bann" sloop of war, it appears that the first case of the disease which appeared on the island was on the 18th day after the arrival of the "Bann," as at Boa Vista it went on attacking one or two individuals daily after that time.

As to the remarkable state of the weather supposed to have existed at Boa Vista, which Dr. M'William had neglected to notice, it appears that all that gentleman's observations upon this point tend to prove that there was nothing uncommon in the state of the weather (and this is confirmed by Dr. King's reply to query 12, page), but, on the contrary, that the districts which generally suffered most from the endemic fever in sickly seasons were in a most unaccountable degree exempt from disease during the epidemic of 1845, and that, in making the circuit of the island, he fell in with many families who had fled from the different villages at the outbreak of the fever, who had all escaped, and, in fact, that the population continued healthy wherever communication with the infected was cut off, and complete seclusion established.

Upon this supposed state of the weather, however, is founded Dr. King's mission, and apparently for the sole purpose of reporting upon the following additional Instruction, No. 12: "Be very particular in your inquiry as to the state of the weather as related by the Governor-General of the Cape de Verds Islands, and the British Consul there, previously to the commencement of the fever, and take every pains to ascertain the date of its commencement, and its effects upon the surrounding country." The reply to this (supposed to be) all-important question, it was hoped would have overturned the whole of the conclusions come to by Dr. M'William; it is as follows: "The periodical rains, contrary to what usually happens, did not set in until late in September (1845), and the fall, though heavy at first, was altogether less in quantity than had been known for several years. In October, November and December the winds were light and variable, with frequent calms, and the weather, in consequence, extremely sultry and oppressive; the grass and green crops were nearly destroyed by the long previous drought, and what little appeared after the rains was devoured by the locusts, which visited the island this year in greater numbers than was ever known to be the case before; the loss of their cattle in 1845 was attributed to starvation, as the crops had been destroyed by the causes I have just explained."

This is the reply to the great question which Dr. King had to solve, and which amounts, in fact, to nothing; the rains were late and heavy, but the great quantity of rain which was to have produced the supposed malaria, turns out to have been less in quantity than had been known for several years; Dr. King does not refer, in the most distant way, to any effect which the rains had upon the population, though he certainly says, page 6, "That the season of 1845 at Boa Vista was most unusual, and in many respects very remarkable."

The reply to so much of No. 12 Instruction ought to terminate his mission, but he finds it convenient to bring into his Report the year 1846, which was quite unconnected with his instructions, as they had reference only to the origin of the fever in Boa Vista in 1845; he goes on to say, "In the year 1846 the rains began about the middle of August, and fell in abundance in the three following months, but, as in the former season, the winds were light and variable, the calms frequent, and at length the atmosphere became stagnant and pestilential." This state of the atmosphere, it must be observed, was in 1846, and had nothing to do with the fever of 1845; and he gives no account of the prevalence of any malignant fever in consequence of this pestilential state of the atmosphere in 1846; on the contrary, he states that he saw, altogether, only 14 or 15 mild cases of fever, and for the simple and satisfactory reason, that there did not occur any other example of this disease during his sojourn of six weeks on the island.

Dr. King, no doubt, had a most unpleasant duty to perform, and under most unfavourable circumstances, from a variety of causes, taking into consideration also the length of time which had elapsed from the period of the "Eclair" having been at Boa Vista, as well as from Dr. M'William's having gone over the ground before him; he had, however, one advantage, viz. that of perusing and animadverting upon Dr. M'William's Report before giving in his own.

He is evidently at a loss and much embarrassed in winding up his Report, as, owing to the weakness of the cause he had been sent to support, the total want of evidence in favour of local origin (the object of his 12th Instruction), and the impossibility of making any statement (likely to prove satisfactory at head quarters) against the positive and incontrovertible proof of the importation of the fever into the island by the "Eclair," he does not venture to give any opinion of his own, or to state that he had come to any decided conclusion as to the origin of the fever in Boa Vista in the year 1845, but leaves it to impartial judges, who, he says, "from the facts ascertained on the spot would be furnished with sufficient information to enable them to decide as to whether the disease was in reality imported by the 'Eclair,' or that it derived its origin from other sources;" he perseveres to the last in declaring the non-contagious nature of the fever, and trusts "that he has brought to light a combination of remote and directly exciting causes in active operation, quite sufficient, and altogether independent of contagion, to account for the origin and spread of the fever both in the ship and on the island."

This combination of remote and exciting causes, however, have not been stated; they appear to have existed only in his own imagination; and in bringing his report to a close, he says, "I am fully sensible of the great responsibility I incur in presuming to offer a decided opinion on this momentous question; but, having compared the results of the investigation, which is now concluded, with the impressions made on my mind after repeated services in the West Indies, and particularly at Bermuda in 1843, where I am convinced the disease was neither imported, nor manifested a contagious nature, I must now declare my belief firmly, but conscientiously, that the yellow fever is not a contagious disease."

This is certainly a most extraordinary conclusion to the Report; and, after stating his great sensibility, responsibility and presumption in offering a decided opinion upon this momentous question, it really does not appear what the momentous question was; it certainly had nothing to do with yellow fever, neither does it appear that he offers any opinion, certainly not a decided one, upon the object of his mission, which was simply this, viz., query 2, Whether the fever which prevailed in the island of Boa Vista in the year 1845 was an indigenous production, or whether it originated in causes connected with the "Eclair"?

Upon this important Instruction I have before stated Dr. King has given no opinion of his own, but leaves it to be decided by impartial judges.

The sum total of his Report is this—"The yellow fever is not a contagious disease."

This, however, is a question which he was not called upon to solve; the words do not appear in any one of his 12 Instructions; and I think I may safely state, that if his opinion upon that disease had not been well known before he left England, he would not have been selected for the particular service.

The mission appears to have been most unnecessary, and its result not very creditable to the parties concerned, its object having evidently been, not to search after and ascertain the truth, but to support a false and erroneous theory, the upholding of which has proved most destructive to human life, more particularly on the coast of West Africa and in the West Indies.

I have &c.
(signed) *Wm. Pym*,
Superintendent-General of Quarantine.

BOA VISTA FEVER.

COPY of a LETTER from Sir *William Pym*, Superintendent-General of Quarantine, to the Lords of the Privy Council, containing Observations upon Dr. *King's* REPORT upon the *Boa Vista* FEVER in 1845.

(*Mr. Wodehouse.*)

Ordered, by The House of Commons, *to be Printed,*
21 *August* 1848.

674.

Under 3 oz.

John Simon FRS
with the Compliments of
the Author

REPORT

ON

THE FEVER AT BOA VISTA,

BY

DR. MC WILLIAM.

Presented to the House of Commons, in pursuance of their Address of the 16th March, 1847

LONDON:
PRINTED BY T. R. HARRISON.

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Report of Dr. McWilliam on the Fever at Boa Vista.

Sir William Burnett to the Secretary to the Admiralty.

Sir,

Admiralty, October 30, 1846.

DR. J. O. McWILLIAM, Surgeon, Royal Navy, who was, in February last, sent to the Island of Boã Vista in Her Majesty's ship "Rapid," at my particular and earnest request to their Lordships, to make an impartial inquiry into all the circumstances of the supposed introduction of fever into that island from the crew of Her Majesty's ship "Eclair," having returned to England some time ago, and transmitted to me the accompanying report, I beg to lay the same before their Lordships, together with copies of the letter and instructions the doctor received from me for his guidance. Also an extract of a letter from the Governor-General of the Cape de Verd Islands, published in the "Gibraltar Chronicle," and likewise extracts of letters from Mr. Macaulay and the British Consul, residents on the Island of Boã Vista, distinctly showing the very remarkable state of the weather preceding the attack of the inhabitants of the island, (which very important circumstance in a case of this kind I regret to observe Dr. McWilliam has omitted to take any particular notice of,) which attacks do not appear to have taken place till a month after the departure of the "Eclair."

Dr. McWilliam appears to have taken considerable pains to gain information; but after a careful perusal of the papers he has sent I am compelled to say that I cannot conscientiously arrive at the conclusion the Doctor has done, viz., "That the fever was occasioned by the intercourse with the 'Eclair,'" which is, however, the chief point on which we differ; agreeing with all my late reports to their Lordships on the same subject; and also in conformity with a former report of mine to their Lordships respecting the case of His Majesty's ship "Bann," in the year 1824.

I have, &c.,
(Signed) W. BURNETT,
Director-General.

Inclosure 1.

Sir William Burnett to Dr. McWilliam.

Sir,

Admiralty, January 31, 1846.

THE Right Honourable the Lords Commissioners of the Admiralty having determined that you should proceed to Boã Vista in Her Majesty's ship "Rapid," for the purpose of making an inquiry into all the circumstances attending, or supposed to have attended, the late visit of the "Eclair" to that island, when suffering under an attack of fever, contracted while stationed on the coast of Africa, you are to proceed thither in that vessel, which is reported ready for sea on the 1st of February, and which vessel their Lordships have directed to convey you thither, where, without the vessel's communicating with the shore, you will, with your luggage, be placed in a shore boat and landed for the purpose of inquiry; and the "Rapid" having been ordered to remain twenty-four hours off Boã Vista, for the purpose of receiving from you an account of the state of health of British subjects there residing, and whether they are in want of any assistance which may be sent to them from other places; you will take care to furnish the captain of that ship with the necessary information, and you are to take care to communicate with me at all opportunities during the progress of the inquiry.

As their Lordships will repay all your expenses, you are permitted to draw upon the Accountant-General of the Navy for such sums of money as you may from time to time require for carrying on this service; and in conducting this inquiry you are to govern yourself by the strictest impartiality.

The inclosed instructions will serve to guide you in the general discharge of the inquiry, but you are nevertheless to take advantage of any circumstances which may arise, in further elucidating the subject.

Having completed the object in view you will return to England and make a full report of all the circumstances which have come to your knowledge.

I am, &c.
(Signed) W. BURNETT,
Director-General.

Inclosure 2.

Instructions to Dr. McWilliam.

YOU are to ascertain whether fever was prevalent in Boã Vista or in any of the other islands at the time the "Eclair" arrived there. And if so, how long it had prevailed?

What was its character—Epidemic, endemic, or sporadic?

Whether it had originated in the island, or in any of the other islands, or been imported?

And whether there was any proof of its being of a contagious nature, or data to lead to a contrary conclusion?

You are to obtain, if possible, a correct list of the names of all the strangers or islanders who visited or were employed on board the "Eclair" while she remained at Boã Vista; and a similar list of the soldiers, islanders, or other individuals, strangers, who were stationed in the Fort on the small island, or visited the island, during the time the crew and sick of the "Eclair" were disembarked there; and to ascertain if any of either of those parties have since been affected with fever similar to that of the "Eclair;" and if so to obtain—

A list of their names,
Date of attack, and the
Result of the Disease;

And to state whether it appears the disease was contracted from exposure to some morbific agent of a miasmatic nature, generated or existing within the vessel, or from exposure to a specific contagion emanating from the bodies of the sick?

The latter query applies particularly to the soldiers stationed as a guard in the Fort?

You are also to ascertain whether there is any direct proof of the disease having been communicated by those individuals to a second party, and from that to a third party, and so on; and if any of them have died in the Fort, you are to make particular inquiry if they were ever on board the "Eclair?"

And whether it appears that the fever was communicated to any individual in the house where the officers and their servants resided, or to any person in its immediate vicinity?

Also, whether any of the women who washed the officers' clothes contracted fever; and were they Africans or islanders? black or coloured?

Whether there is any proof of the disease breaking out on other parts of the island where, from the distance from the town and anchorage, or other circumstances, the inhabitants could have had no communication either direct or indirect with the "Eclair?"

Whether the disease has spread to any of the other neighbouring islands; and by what means?

And further, whether there are any circumstances from which it may be inferred that the fever lately prevalent at Boã Vista was an indigenous production, or that it originated in causes unconnected with the "Eclair?"

In pursuing this inquiry you are also to pay particular attention to the directions contained in my letter of this date, and in all cases you are to state the sources from whence you obtained the information.

Dated this 31st day of January, 1846.

(Signed) W. BURNETT,
Director-General.

Inclosure 3.

Don Jose Miguel de Noronha, Governor-General of the Cape de Verd Islands, to the Portuguese Consul-General at Gibraltar.

(Extract.) *Island of Brava, January* 27, 1846.

THE recollection of the circumstances referred to did not fail to fill my heart with sadness, on account of the premature death of the worthy and indefatigable Commander Estcourt, other officers, and many of the crew of the "Eclair," as well as of the breaking out of the terrible disease in the Island of Boã Vista, which attacked and cruelly decimated its unfortunate inhabitants, natives as well as strangers.

The then resident members of the Government considered it necessary, in order to avoid their becoming victims of the scourge, to retire hastily from the place to the Island of Brava.

It is true that the disease, which was perfectly endemic—for not one of those who emigrated to the different islands of the archipelago had the disease, or communicated it to others—did not make its appearance till a month after the departure of the steamer; but as Boã Vista was permitting the landing of the sick from the "Eclair" on a small island at a mile distance from the port of Sal Rey, where the pestilence broke out, it was natural enough that the public should attribute to my condescension the evils which took place, and I consequently look forward to bitter censures and severe animadversions.

I feel, nevertheless, that I have complied with a sacred and binding duty of philanthropy, and that the disease had its origin in the great falls of rain which took place at a very advanced period of the season, and which remained stagnant in the neighbourhood of the place, as happens every year in Villa da Praya*; I therefore calmly wait the result.

Inclosure 4.

Mr. Macaulay to the Earl of Aberdeen.

(Extract.) *December* 24, 1845.

THIS brings me to observe upon the mode in which it is generally believed the "Eclair" fever was communicated to Boã Vista. When the Fort, which had been used as an hospital by the "Eclair's" crew, was re-occupied by the small military guard who usually do duty there, two of the soldiers were seized with fever, and were immediately removed into the crowded town of Porto Sal Rey. The first serious case of fever which subsequently attracted observation, occurred at the house in which one of these sick soldiers had lodged; but so long an interval had elapsed between the departure of the "Eclair" and the appearance of this case of fever in the town, that we were all disposed in the first instance to attribute it, as well as the general sickliness of the place, rather to stagnant water which had settled in great quantity at the back of the town, joined with the great heat of the weather and the dirty state of the streets.

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* The capital of St. Jago, the principal island of the Cape de Verd group.

Without a better acquaintance with the facts of the case than I possess, I am unwilling to pronounce an opinion how far the general Government of the province, or the Municipal Chamber of Boã Vista, or the Military Commandant of the island, may justly be charged with a want of proper prudence and caution in their proceedings subsequently to the departure of the "Eclair;" but it is a satisfaction to know that the "Eclair" had left Boã Vista nearly a month before any case of "Eclair" fever exhibited itself in the town. This circumstance, coupled with the fact that no injury whatever had resulted from the unrestricted intercourse which had subsisted during the whole of the "Eclair's" stay in the harbour, between the officers and men (not in hospital at the Fort) and their friends on shore, proves, I think clearly, that had the building which was so long used as a fever-hospital, been properly fumigated and purified prior to its re-occupation, and had the two soldiers who were there seized with fever been kept (like the fever patients of the "Eclair,") from all intercourse with the densely-peopled and closely-built town, no bad consequences would have been experienced at Boã Vista from the visit of the "Eclair," and the kindness and hospitality which were there extended to her. This neglect, however, it may be urged on the other hand, is attributable in a great degree, if not entirely, to the false estimate which was formed by all the medical men, of the dangerous and malignant character of the disease which had prevailed on board the "Eclair."

Inclosure 5.

Consul Rendall to the Earl of Aberdeen.

(Extract.) *December* 22, 1845.

UP to the 9th of October, extraordinary heat, and the fall of a large quantity of rain, had been experienced—events which were surprising to the oldest inhabitant. The fever then began to show itself; and the first fatal case in the town is said to have taken place in the house where the two coloured soldiers from the Fort had been brought and recovered from their sickness. Each succeeding day, to the end of the month, gave two, and sometimes three cases daily, all occurring within the immediate neighbourhood of the house where the first death took place. A Portuguese surgeon had been brought from Porto Praya, who, with the Portuguese practitioner in the town, maintained that the fever arose from the presence of the stagnant water; and they so held the same opinion until the 20th of November, when they openly declared it to be a fever of the worst description, and of a most contagious nature. From this date clean bills of health to vessels were refused; and all vessels leaving the port for any of the neighbouring islands were subjected, upon their arrival, to be placed in quarantine for thirty days.

Up to the first week in December the fever continued to rage, and at that period it had found its way into almost all the country villages, the deaths averaging seven and eight daily. The last report I have received from Boã Vista is to the 21st instant, to which date 250 had died; but it is stated that for fourteen days previous there had been no deaths in the port and in three of the country villages, although the fever still existed in two of them.

Inclosure 6.

Dr. McWilliam to Sir William Burnett.

Sir,

Southsea, Hampshire, September 17, 1846.

I HAVE the honour to transmit you the inclosed report on the origin and progress of a fever which prevailed at the Island of Boã Vista, in the Cape de Verds, during part of the last and present years.

The investigation into the nature and history of the disease was made in accordance with instructions received from you in the month of February last; and in conducting it I endeavoured honestly to fulfil the important duty confided to me.

The report consists of five parts.

The 1st part contains a nominal list of all the Europeans who were on the Island of Boã Vista when Her Majesty's ship "Eclair" arrived there; of those who remained and escaped; and of those who were attacked, with the result. Evidence relative to the arrival of Her Majesty's ship "Eclair" at Boã Vista; to the women who washed the clothes from the "Eclair," and the examination of the survivors; to the landing of the crew at the Fort upon the small island; the progress of the fever on the small island; its partial appearance in Porto Sal Rey; its breaking out among the guard at the Fort, and afterwards in various parts of the Island of Boã Vista.

The 2nd part contains nominal lists, with the examination of the surviving labourers who were on board the "Eclair."

The 3rd part contains a nominal list of the labourers belonging to Boã Vista, who were employed in the launches, coaling and watering Her Majesty's ship "Eclair," with the examination of the survivors.

In the 4th part are lists of labourers from various parts of the Island of Boã Vista, who were employed at the coal-heap on the small island in the service of Her Majesty's ship "Eclair," with the evidence of the survivors, and that of Dr. Almeida.

Part 5 contains a brief historical summary of the facts that were elicited by personal interrogation of every man on the island who had been in any way connected with the "Eclair," and of several other persons who possessed information on the subject of the fever, with such remarks as were suggested, after an impartial and careful consideration of all the circumstances that came under my notice.

I would only observe, that whatever view may be taken as to the correctness of the conclusions at which I have arrived, the facts contained in the examinations are set down word for word, as nearly as possible without rendering them unintelligible. The truth of the statements may be relied upon, however erroneous may be the deductions that have been drawn from them.

I am in the daily expectation of some other documents connected with the state of health on the other islands of the archipelago, which did not reach me, owing to the interruption of intercourse between them and Boã Vista, from the rigorous quarantine which had been, and still continued (when I left on July 15) to be imposed on that island. These shall be duly forwarded on their arrival. The same cause prevented my leaving Boã Vista after the investigation was terminated, and will I trust account for the long period during which this report has been withheld.

I have, &c.,
(Signed) J. O. McWILLIAM, M.D.,
Surgeon, R.N.

In submitting this Report to your inspection, I would with great deference trust that it will in some degree meet with your approbation; and hope that in consideration of my services in the Niger and in other parts of the world, added to my recent employment in the Cape de Verds, you will be pleased to recommend me to my Lords Commissioners of the Admiralty as deserving of promotion.

(Signed) J. O. McWILLIAM,
Surgeon.

REPORT.

PART I.

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1.—*Europeans who were on the Island of Boã Vista, in the Cape de Verd Group, in September* 1845.

Portuguese*	†56
English	23
Americans	2
French	2
Spaniards	3
Total number of Europeans	86

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* The Governor-General and his suite of nearly sixty Europeans, are not included, as they were merely visitors, and left the island.

† Lieutenant Santos and his family, consisting of three persons, did not arrive in Boã Vista from Sal until November 1845. Two others came from Lisbon in October: one, a convict, survives, but the other, a soldier, died two months after his arrival.

2.—List of the Portuguese Residents at Boã Vista, in the Cape de Verds, in September 1845.

Names.	Rank.	If attacked with Fever, and when.	Result.	Remarks.
Hypolito José Xavier d'Almeida	Licenciado	Not attacked		
Lorenzo José Viereia ..	Capt. Port	Ditto		
Antonio Aug. J. Thurion	Collector Customs	Ditto	..	Left island in November
Antonio de Sousa ..	Merchant	Ditto	..	Ditto
Joaquim P. de Silva ..	Lieutenant	Ditto	..	Ditto
Major Mascarenhas ..	Military Commandant.	In Dec. 1845	Recovered	Remained on island
Joaquim José dos Santos..	Lieut. Artillery	Feb. 1846	Do.	Ditto. Arrived from Sal in November 1845
Joao Roberto dos Santos..	Son of Lieut. Santos	March	Do.	Ditto
Antonio Pereira Alio ..	Custom-House Officer	Not attacked	..	Remained on island
Francisco Cosmo Nunes..	Writer	Jan. 1846	Recovered	Ditto
Antonio Joaquim de Lima	Storekeeper	Nov. 1845	Do.	Ditto
Manoel Phedem	Servant	Dec. 1845	Do.	Ditto
Antonio de Bilhar ..	Billiard marker	Nov. 1845	Do.	Ditto
José Francisco	Storekeeper	Nov. 1845	Do.	Ditto
José Lopes	Shoemaker	Nov. 1845	Do.	Ditto
José Pinto Santos ..	Storekeeper	Dec. 1845	Do.	Ditto
Antonio Francisco Ferreira	Shoemaker	Dec. 1845	Do.	Ditto
Daniel Gesente	Ditto	Dec. 1845	Do.	Ditto
Alexandre A. Roderigues	Baker	Dec. 1845	Do.	Ditto
Miguel da Cunha ..	Clerk	Jan. 1846	Do.	Ditto
Joao F. Pinta Goira ..	Convict	Not attacked	..	Ditto
Manoel Sardinia	Farmer	Ditto	..	Ditto
José Pedro Poste.. ..	Labourer	Dec. 1845	Recovered	Ditto
José	Tailor	Not attacked	..	Ditto
José Carlos Lisboa ..	Writer	Oct. 1845	Died	Lived next to Anna Gallinha
Antonio Creado	Merchant's servant	Nov. 1845	Do.	Visited Lisboa.
Joao Espindola	Convict	Nov. 1845	Do.	Came from Portugal in October 1845
Antonio Carpenteiro ..	Carpenter	Nov. 1845	Do.	Remained on island
Joaquim Ferreiro.. ..	Sailor	Jan. 1846	Do.	Came from a vessel in harbour

Names.	Rank.	If attacked with Fever, and when.	Result.	Remarks.
Antonio Grannadeiro	Convict	Nov. 1845	Died	20 years on island.
Rufino dos Santos	Ditto	Nov. 1845	Do.	4 years on island
José de Amorion Almeida	Ditto	Nov. 1845	Do.	8 years on ditto
Francisco da Freitas	Labourer	Dec. 1845	Do.	24 years on ditto
Padre Ignoccenció	Priest, Rabil	Nov. 1845	Do.	13 years on ditto
Padre Francisco	Priest, North Side villages	Jan. 1846	Do.	13 years on ditto
Leiria Antonio Santos	Convict	Jan. 1846	Do.	8 years on ditto
Luis Barros	Carpenter	Nov. 1845	Do.	
Females.				
Donna Maria dos Santos	Lady of Lieut. Santos	March 1846	Recovered	Arrived from Sal in November 1845
Donna Maria J. dos Santos	Daughter of Ditto	March 1846	Do.	Ditto
Maria Victoria	Convict	Nov. 1845	Do.	3 years from Portugal
Rita Escama	Tailoress	Dec. 1845	Do.	24 years ditto
Maria Rufina	Storekeeper	Dec. 1845	Do.	8 years ditto
Maria	Housekeeper	Dec. 1845	Do.	3 years ditto
Joaquina Mascarenhas	Ditto	Nov. 1845	Died	30 years from Lisbon
Antonia Rita da Freitas	Tailoress	Nov. 1845	Do.	24 years ditto
Maria Bernarda	Tailor's wife	Dec. 1845	Do.	2 years ditto
Anna Gallinha	Tailoress	Oct. 1845	Do.	10 years ditto
Soldiers in Barracks.				
Joao Alexandre Roque	Private	Sep. 20, 1845	Do.	At the Fort, from Lisbon, August 1844
Joaquim Agostinho	Corporal	Sep. 21, 1845	Do.	Ditto
Luis Francisco Pimentel	Private	Nov. 6, 1845	Do.	In barracks, Porto Sal Rey; six years on island
Jose Maria Maraes e de Castro	1st Serjeant	Nov. 8, 1845	Do.	In barracks; two years on island
Francisco da Cunha	Private	Nov. 8, 1845	Do.	Uncertain how long
Manoel Jose Alves Guimaraes	Prisoner	Nov. 17, 1845	Do.	5 years at St. Jago
Luis Briza	Private	Nov. 12, 1845	Do.	1 year from Lisbon
Francisco Antonio	2nd Serjeant	Nov. 26, 1845	Do.	Two months only from Lisbon
Alexandre Antonio	Private	Nov. 1845	Recovered	

3.—LIST of the English Residents at Boã Vista, Cape de Verds, in September 1845.

Names.	Rank.	If attacked with Fever, and when.	Result.	Remarks.
Henry William Macaulay	Commissioner Judge	Not attacked	..	Left for San Nicolao, October 22, 1845.
Hon. Mrs. Macaulay	..	Ditto	..	Ditto
Master H. Macaulay	..	Ditto	..	Ditto
T. Macaulay (infant)	..	Ditto	..	Ditto
Elizabeth Hodgson	Servant to Mr. Macaulay	Ditto	..	Ditto
Helen ———	Ditto	Nov.	..	Returned to Boã Vista, remained until the 18th Jan.
John Dachin	Ditto	Nov. 1845	Died	Ditto
Charles Pettingal	Arbitrator Mixed Com.	Nov. 1845	Do. Dec. 5, in quarantine at St. Nicolao	Left Boã Vista on 22nd Oct., and returned 11th Nov.
Mrs. Pettingal	..	Not attacked	..	Ditto
Miss Pettingal	..	Nov. 1845	Died Nov. 24, at Boa Vista	Ditto
John Rendall	Consul	Not attacked	..	Left for San Antonio Dec. 1, 1845
Mrs. Rendall	..	Ditto	..	Ditto
George Rendall	Merchant	Ditto	..	Ditto
John Rendall	Vice-Consul, St. Jago	Ditto	..	Left the island March 1845.
John Jamieson	Consul's store-keeper	Ditto	..	Remained on the island.
Anne ———	Consul's servant	Ditto	..	Left December 1, 1845.
Children (two)	..	.	..	Ditto
Mrs. Learner	..	Nov. 1845	Died Nov. 27	Remained on island.
Peter Kenny	Surgeon	Nov. 1845	Died Nov. 27	
John Knevett	Clerk	Not attacked	..	Left island Dec. 1,1845
George Tait	Ditto	Ditto	..	Ditto March 1846.
—— Barkley, Commissary from Gambia	Commissariat Department	Ditto	..	Ditto December 1, 1845.

Names.	Rank.	If attacked with Fever and when.	Result.	Remarks.
AMERICANS.				
—— Plasket	Captain, merchant ship	Dec. 1845	Died	
A sailor (name unknown)	..	Dec. 1845	Do.	
FRENCHMEN.				
Adolphe Benjn. Thinel ..	Storekeeper	Nov. 1845	Recovered	Five years on island.
Bernard Philippe Montiero	Ditto	Ditto	Do.	Nineteen years ditto.
SPANIARDS.				
Andrea Gannia	Carpenter	Not attacked	..	Had fever in Havana, with black vomit.
José Pedro Pons	Cigar-maker	Ditto	..	Ditto
Don Pedro M. Pito ..	Captain, merchant-ship	Ditto	..	Ditto

SUMMARY.

	Total on Island.	Attacked with Fever.	Recovered.	Died.	Not attacked.
Portuguese.—Total No. 56					
Left island, males 3					
Remained, males	43	37	16	21	6
„ females	10	10	6	4	..
English.—Total No. 23.					
Left island, males 8					
„ females 6—14					
Remained, males	5	3	..	3	2
„ females	4	3	1	2	1
American	2	2	..	2	..
French	2	2	2	..	..
Spaniards	3	..	..	..	3
Grand Total	69	47	25	32	12*

* Among those who escaped, the Surgeon of the Governor-General deserves to be particularly noticed, for he saw a great many sick. Messrs. Moraes and Leao, who came from Lisbon in February 1846, were both attacked, but they recovered.

4.—*Evidence relative to the arrival of Her Majesty's ship "Eclair" at Boã Vista; and to the native women who were employed to wash the soiled linen belonging to the officers of that vessel.*

Porto Sal Rey, Island of Boã Vista,
in the Cape de Verd Group, April, 1846.

AT the house of Henry William Macaulay, Esq., Her Majesty's Commissioner, &c., of the Mixed Commission Court, Boã Vista.

John Jamieson, a native of London, store-keeper of John Rendall Esq., Her Britannic Majesty's Consul at Boã Vista, called in and examined.

1. How long have you been on this island?—Upwards of six years.

2. Has the island been in general healthy during that period?—Always remarkably healthy, until after the departure of Her Majesty's ship "Eclair" in the month of September last.

3. Do you recollect at what time the "Eclair" arrived here?—Yes, perfectly. It was on or about the 21st of August last.

4. Did you go on board of the "Eclair?—Yes, immediately on her arrival the Consul desired me to go on board; on getting alongside, Captain Estcourt told me there was fever on board, and that he was on that account doubtful whether the authorities here would not put the vessel in quarantine. Upon this I returned to the shore, and stated to the Consul what Captain Estcourt had said. Whereupon the Consul went with Dr. Kenny (the only regular practitioner on the island) to Don José de Norronha, Governor-General, at that time residing here. On the Consul's return from the Governor-General he ordered me to accompany Dr. Kenny to the "Eclair," and we were at once admitted on board. Captain Estcourt made some inquiries of me about water and refreshments for the crew, and said he intended to remain a month or so at the island for the benefit of the crew, many of whom were ill with fever. Dr. Kenny went below and looked at the sick, in company with the surgeon of the ship; on his return to the deck, he said, "It is only the common coast fever." The doctor and I then went on shore. Shortly afterwards, Captain Estcourt and the First Engineer came on shore in a gig manned by six Kroomen. Captain Estcourt went first to the Consul's and afterwards to Mr. Macaulay's. The Kroomen remained about the pier until the captain returned to his ship in the evening. The engineer after only a short stay on shore also went off to the ship.

5. Did you visit the ship soon afterwards?—Yes, I went on board the same night with the engineer, and remained there till half-past 10, when I returned to the shore. The boat that brought me on shore contained at least a dozen bags of soiled linen belonging to the officers of the ship; not knowing what to do with the linen, I took it to one of the Consul's store-rooms and deposited it there for the night. On the following morning, at the desire of the Consul, I distributed the linen to the washerwomen of the town.

6. Do you know the names of the washerwomen to whom the clothes were given to be washed?—Yes, I can give the names of all of them.

Emilia Joana Mariana,
Maria de Anna Limoa,
Anna Maria da Rocha,
Libania Roderigues,
Maria da Rocha,
Anna Santa Anna,
Maria Leonora,
Joana Maria da Graça,
Sabina Diego,
Delphina Barbara,
Antonia Chileco,
Antonia Romess,
Margarita de Lima,
Anna Margarita,
Justinia Britho,
Maria Rosa,
Aniceta Ferreira,

7. Can you bring the above-named washerwomen here?—Yes, with the exception of the last-named four, who are dead.

Emilia Joana Mariana, mulatto, native of Boã Vista, aged 40, examined. (Porto Sal Rey.)

8. When did you receive the soiled linen from the "Eclair?"—The day after she came in.
9. When did you return the linen, and to whom did you return it?—In three days after I got it: to Maria Diana Limao.
10. Have you had the fever?—Yes, but not until late in December last.
11. What family have you?—I had two boys and two girls, but I lost one girl.
12. When did she die?—A short time before Dr. Kenny died.
13. Who was first taken ill in your house?—My husband was first taken ill.
14. Had he been to see any sick people?—Yes, a great many. He is a country doctor, and cupped numbers who had the fever.
15. Did your daughter attend your husband during his illness?—No; she went to Cabeçada to see her grandmother, who was then ill and afterwards died.
16. Was there fever in Porto Sal Rey before your daughter went to Cabeçada to see her grandmother?—Yes, and my husband was just taken ill.
17. Did your daughter die at Cabeçada?—Yes; she died after four days' illness: she had black vomit.
18. How long was your husband ill?—He was several days with high fever, and a long time weak.
19. Were you attacked when your husband was ill?—No, when he was getting better.
20. How long were you ill?—I had fever only four days; but I had a severe diarrhœa seven or eight days.
21. Were you ever away from the island?—No.
22. Your health has in general been good?—Yes.

Maria de Anna Limoa, mulatto, native of Boã Vista, aged 50, examined.

23. Did you receive foul linen from the "Eclair" to be washed?—Yes, I received linen from the captain and several of the officers.
24. Who gave it to you?—John Jamieson.
25. When did you return the linen?—In three days after I got it; I returned the whole clean to the captain's steward at Mr. Macaulay's house.
26. Have you had the fever?—Yes, I have; but not until late in January last.
27. What family have you?—Two sons, a niece, and a nephew.
28. Were they taken ill?—Yes, all of them.
29. Who was first attacked?—Cundia, my niece.
30. When was she taken ill?—Not until January last.
31. Did she assist in washing the clothes?—Yes.
32. Had any or all of you been in houses where there were sick people?—Yes, all of us.
33. Who was next attacked?—My son; then the nephew.
34. You all recovered?—Yes, all of us.
35. Have you ever been away from the island?—Yes, I have been in America, Lisbon, Greece, St. Jago, and others of the Cape de Verds.
36. Had you ever fever before?—No; but I had small-pox at Porto Praya in St. Jago.

Anna Maria da Rocha, mulatto, native of Boã Vista, aged 19, examined. (Porto Sal Rey.)

37. You received some foul linen from the "Eclair?"—Yes, I received some to wash the day after the ship came in.

38. To whom did you return it?—To Maria Diana Limoa.

39. Do you usually reside at Porto Sal Rey?—No, I reside at Fundo das Figueiras, one of the villages on the north side of the island.

40. Then were you sick at Porto Sal Rey, or at Fundo das Figueiras? —I was taken ill at Fundo das Figueiras.

41. Who was ill at Fundo das Figueiras when you went there?— The son of José Anterao da Cruz.

42. Did you see him?—No.

43. Did you live near him?—No.

44. Had you been in any houses at Porto Sal Rey where there were sick?—Yes, I saw Emilia Joana Mariana when she was sick.

45. How long were you ill?—Four days only.

46. How many are there in your house?—My father, sister, and myself.

47. Were they all attacked?—Yes, after I was.

48. Had your father and sister seen any sick people?—No, none besides myself.

49. How long was your father ill?—He was very ill indeed, nearly a month confined to the house.

50. And your sister?—She was only four days ill.

51. Did she recover?—Yes.

52. Were you much visited when you were laid up?—Not much, only by a few.

Libania Roderigues, a negress, native of Boã Vista, aged 17, examined. (Porto Sal Rey.)

53. You received some foul linen from the "Eclair" to be washed?— Yes, I did.

54. Do you know whose linen you got to wash?—No, I do not; it belonged to one or more of the officers.

55. To whom did you return it?—To Maria Diana Limoa.

56. Have you had the fever which has been prevailing in this island? —Yes, but not until January last; I was then at Boaventura.

57. Had you been much among the sick before you were attacked? —No, I had not seen any sick person except my mother.

58. Where was your mother taken ill?—At Boaventura, Rabil.

59. Do you live at Rabil?—No, we went there from Porto Sal Rey, thinking to avoid the fever.

60. Do you know if your mother visited any sick people?—I am not sure.

61. How long was your mother ill?—She was only four days in fever.

62. How many are there in your house?—My father and mother, and six children.

63. Who was first taken ill?—My mother first, then my father; then two brothers, on the same day, and the rest, with myself, soon afterwards.

64. Did you all recover?—Yes.

65. Has your family in general enjoyed good health?—Yes, always, until we had the late attack of fever.

Maria da Rocha, dark mulatto, native of Boã Vista, aged 22, examined. (Porto Sal Rey.)

66. Did you receive soiled linen from the "Eclair," to be washed?—Yes, I did, soon after the vessel arrived here.

67. Have you been at all ill during or since the "Eclair" was here?—I was sick, but not until very lately.

68. Have you a family?—Yes, I have a husband and two children.

69. Who was first taken ill in the house?—Myself; then my husband, and next one of the two children.

70. Had you been among sick people?—No.

71. Had your husband.—Yes. He had been in almost every sick house in Porto Sal Rey.

Anna Santa Anna, a negress, native of Boã Vista, aged 60, examined. (Porto Sal Rey.)

72. I believe you had some soiled linen from the "Eclair" to wash?—Yes, I had.

73. With whom do you live?—I am a slave, and live with my master, who was called "Clophina." When the sickness appeared in Porto Sal Rey, he went to Rabil, and took me with him; when the fever was on the decrease, he returned for some time to the port. After this he went to João Gallego, one of the northern villages.

74. Did you accompany your master to João Gallego?—No.

75. Have you had fever?—No.

76. How many were there in your master's house?—In all, fourteen persons.

77. How many of these were attacked besides your master?—Only his daughter and a slave who accompanied him to João Gallego.

79. Did they recover?—Yes.

80. Did all go to Rabil?—Yes.

81. Then am I to understand that those who went to Rabil (Boaventura), and returned to Porto Sal Rey and stopped there, escaped being attacked; while your master and his daughter and the slave who went to João Gallego, all had fever?—Yes.

82. Did they all recover?—No. My master died after a few days' illness; his daughter and the slave recovered.

Maria Leonora, negress, a native of Boã Vista, aged 26, examined. (Porto Sal Rey.)

83. You had some clothes to wash from the "Eclair"—Yes, I had.

84. When were you taken ill?—Some time about the 20th of October last.

85. Where do you live?—At Pao de Varella, Porto Sal Rey.

86. Had you been to see any sick persons?—Yes. Antonio Jules, Manoel Affonso, and Antonio Perica.

87. How long were you ill?—About a fortnight.

88. How many are there in the house you live in?—My mother and two sisters.

89. Were they attacked?—Yes; all in one day, soon after I was attacked.

90. Had they been among sick people?—Yes, they had been to see Manoel Affonso; our house is near to that in which he died.

91. Did you all recover?—Yes.

92. Have you and your family in general had good health?—Yes, always until lately.

Joana Maria da Graça, mulatto, native of Boã Vista, aged 19, examined.
(Porto Sal Rey.)

93. You washed some foul linen belonging to the officers of the "Eclair?"—Yes, I did.

94. Where do you live?—In Pao de Varella.

95. Have you had fever?—Yes.

96. When had you the fever?—I do not know the time, but it was after Manoel Affonso, Anna Gallinha, and many others were dead.

97. Had you seen many sick before you were attacked?—Yes, many.

98. How long were you ill?—Twice; the first time five days, and the other time a week.

99. How many are there in the house you live in?—My mother, two sisters, and myself.

100. Who was first taken ill?—Myself, then my mother, and next my sister.

101. Did you all recover?—No; my mother died.

102. How long was she ill?—A week.

103. Had your mother seen many sick?—Yes, she had seen several; and attended upon Mrs. Learner when she died.

Sabina Diego, dark mulatto, native of Boã Vista, aged 45, examined.
(Porto Sal Rey.)

104. You washed some soiled linen belonging to the "Eclair?"—Yes.

105. Have you had fever?—Yes.

106. What family have you?—A husband and one daughter.

107. Were they attacked?—Yes; when the fever was general in the town.

108. Who was first attacked?—My husband first, then myself, and next the daughter.

109. Did you all recover?—Yes.

110. Had you all been among sick people?—Yes, all of us.

Delphina Barbara, a negress, native of Boã Vista, aged 46, examined.

111. You washed soiled linen for the officers of the "Eclair?"—Yes, I did.

112. Have you had fever during or after the "Eclair" was here?—No.

113. How many children have you?—Two.

114. Have they had fever?—Yes.

115. Were they among the sick?—Yes, a soldier called Luis Antonio was ill with fever in my house.

116. Did your children recover?—Yes.

Antonia Chileco, mulatto, native of Boã Vista, aged 30, examined.
(Porto Sal Rey.)

117. You washed soiled linen for the "Eclair?"—Yes, I did.

118. Where do you live?—In Pao de Varella.

119. How many are there in the house you live in?—My mother and seven children.

120. Have you all had fever?—Yes. One of my brothers was first taken ill during the sickness of Manoel Affonso, where he had visited; the rest of the family were taken ill, all about the same time. The brother who was first taken ill is called Leandro Evera; he was in the boat that

took Manoel Antonio Alves, the soldier that buried the two Portuguese soldiers who died at the Fort.

121. Did you all recover?—Yes.

122. Were you visited by others when you were sick?—Yes, by a great many.

123. Do you know of any of your visitors being attacked with fever?—Yes; Luisa Chileco and all her family were taken ill shortly after we were.

124. Have you and your family in general enjoyed good health?—Yes, always, until we had the late fever.

Antonia Romess, negress, native of Boã Vista, aged 26, examined.

125. You washed clothes for the officers of the "Eclair?"—Yes, I did.

126. What family have you?—A mother, and six brothers and sisters.

127. Have any of you been sick?—Yes; all of us have had the fever.

128. Who was first attacked?—My brother. He died.

129. When was he taken ill?—Some time in November.

130. How long was he ill?—Only four days.

131. Had he been among sick people?—Yes, but he was taken ill after he had been carrying some dead bodies to be buried.

132. Who was next taken ill?—A sister; and about the same time all the others in the house.

133. Did all the rest recover?—Yes, all, except my brother.

Margarita de Lima, a mulatto, native of Boã Vista, aged 22, examined.

134. Were you employed washing clothes for the officers of the "Eclair?"—No; I ironed a great part of the clothing.

135. Have you had fever?—Yes; but I was not attacked until January.

136. How many are there in your house?—Fourteen in all.

137. Had you all the fever?—Yes, in a mild degree.

138. And all recovered?—Yes.

(Translation.)
Military Commandant's Office,
Boã Vista, April 17, 1846.

Sir,

I HAVE the honour to send you answers to the questions you have put to me.

I am, &c.
(Signed) JOAO ANTONIO MASCARENHAS,
Major Grad. Commandante Militar.

To J. O. Mc William, M.D.
&c. &c.

1. What was the military force on the island on the 8th September, 1845?—Forty-one rank and file.

2. What was the number attacked with fever?—The whole.

3. What was the number of deaths?—Eleven.

4. What were the names of those who died; and on what dates did they die?—

Private João Alexandre Roque, September 20, at the Fort.
Corporal Joaquim Agostinho, September 21, at Fort.
Private Luis Francisco Pimentel, November 6, barracks.
Serjeant Jose Maria de Maraes e Castro, November 8, barracks.

Private Antonio Lopes, November 8, barracks.
Private Francisco da Cunha, November 8, barracks.
Private Luis Briza, November 12, barracks.
Prisoner Jose Manoel Alves Guimaraes, November 17, barracks.
Private Pedro Gonzalves, November 24, barracks.
Serjeant Francisco Antonio Celestino, November 26, barracks.
Private Antonio Joaquim, November 28, barracks.

5. How long had Joaquim, Agostinho, Joao Alexandre Roque, and Luis Briza, been from Portugal?—They came from Portugal by way of Porto Praya, where they were twenty days, or thereabouts, in August 1844.

6. On what duty had these soldiers been employed, before they were sent to the Fort?—The usual duty of the island.

7. How long had the other European soldiers been on the Island of Boã Vista?—

Private Luis Francisco Pimentel, six years.
Serjeant Jose Francisco Maria de Maraes e Castro, two years.

Prisoner Jose Manoel Alves Guimaraes was in Porto Praya five years, and was sent here during the rainy season there.

Private Francisco da Cunha came from San Nicolao on the 4th September, 1845.

Serjeant Francisco Antonio Celestino came from Portugal in September 1845, and died on the 26th November of the same year.

8. Were any of the soldiers ever on board the "Eclair?"—No, they were not.

(Signed) J. A. MASCARENHAS.

5.—*Return of the Military Guard at the Fort Duke of Braganza, during its occupation by the Crew of the "Eclair."*

Acting Corporal Athanasio Perez,
Private Antonio dos Santos,
,, Pedro Manoel.

Relieved by Corporal Vincente da Cruz Silva,
Private Manoel Antonio Alves,
,, Luis Briza (European).

Relieved by Corporal Joaquim Agostinho (European),
Private João Alexandre Roque ditto,
,, Miguel Barbosa,
,, Pedro Manoel 2do.

(Signed) J. A. MASCARENHAS,
Major and Military Commandant.

Those not marked as Europeans are natives of this or others of the Cape Verd Islands.

First Guard at the Fort.

Athanasio Perez, Acting Corporal, native of this island, aged 21, called in and examined.

139. Were you at the Fort on the small island when the sick of the "Eclair" steam-vessel were brought on shore?—Yes, I was.

140. How long did you remain at the Fort after the sick were landed?—Four or five days.

141. Who were your comrades on guard?—Antonio dos Santos and Pedro Manoel.

142. Did you go among the sick people much?—Yes, we were a good deal among them.

143. Where did you and the rest of the guard sleep while the sick were in Fort?—On the piazza, in front of the room occupied by the sick.

144. Were you quite well all the time you were on this guard?—I felt unwell the day after the sick came on shore, but one of the marines gave me some vinegar, with which I bathed my temples and got some relief. When the guard was relieved I was still rather unwell, but I cleaned my musket and went as sentry at the barracks in Porto Sal Rey; however I soon became very weak, and was relieved.

145. Where were you taken to then?—I was taken to my own house in Porto Sal Rey.

146. How long were you ill?—It was nearly a month before I was able to go out.

147. What did you complain of?—General pains, severe headache, and vomiting.

148. Were you attended by any medical man?—Dr. Almeida saw me only once, when I was convalescent.

149. Who nursed you?—My wife.

150. Did any one else visit you?—Some people came in; not many.

151. Did your wife take sick?—Yes; but not until after the sickness became general in the town.

152. Had you always enjoyed good health until the arrival of the "Eclair?"—Yes, always.

153. Where you ever on board the "Eclair?"—No, never.

154. Are you quite sure you never had fever at St. Jago?—I am quite sure I never had fever anywhere until the arrival of the steamer at this island.

Pedro Manoel, private soldier, negro, native of Boã Vista, aged 22, examined.

155. How long were you at the Fort after the sick of the "Eclair" came there?—I am not quite sure, but I think I was there four days with hem.

156. Did any of the "Eclair" people die while you were there?—Yes, some died every day.

157. Did you and your comrades go among the sick people?—Yes, constantly.

158. Where did you sleep?—On the piazza.

159. Were you at all unwell while at the Fort with the sick crew?—No, not at all.

160. Were you ill afterwards?—Yes, but not until there was a good deal of fever in Porto Sal Rey.

161. Have you in general enjoyed good health?—Yes, always, until lately.

162. Have you ever been at St. Jago?—No, never.

163. Were you ever on board the "Eclair?"—Never.

Antonio dos Santos, private soldier, a dark mulatto, native of San Antonio, aged 25, examined.

164. Were you at the Fort on the small island when the sick landed from the "Eclair" steam-vessel?—Yes, I was.

165. How long were you there after they were there?—I think four days.

166. Were you and your comrades much among the sick?—Yes, always, we saw several die.

167. Were you at all unwell while at the Fort?—No, but I was taken ill three weeks after I came from the Fort to the barracks at Porto Sal Rey.

168. Were you long unwell?—No, I soon recovered.

169. Who was the first soldier you saw ill at the barracks?—Athanasio Perez.

170. Have you ever been at St. Jago?—No.

171. Have you never had fever at San Antonio?—No, never.

172. Have you always had good health?—Always, until the steam-vessel came here.

173. Were you ever on board of the "Eclair?"—No, never.

Second Guard at the Fort.

Vincente da Cruz Silva, corporal, a negro, native of Boã Vista, aged 30, examined.

174. You were, I believe, at the Fort Duke of Braganza, while the crew of the "Eclair" were there?—Yes, I was there with them six or seven days.

175. What guard did you relieve there?—The guard under Acting Corporal Athanasio Perez.

176. Who were your comrades?—Luis Briza, a Portuguese, and Manoel Antonio Alves, a native.

177. Did any of the English sailors and marines die while you were at the Fort?—Yes, some almost every day.

178. Did you mix freely with the sick?—Yes, we did.

179. Were you or your comrades unwell while at the Fort?—No.

180. Were any of you sick afterwards?—Yes, we were all sick afterwards, and Luis Briza the Portuguese soldier died.

181. When did you become sick?—I am not quite sure when, but there were several sick before I was.

182. Had any one died in Porto Sal Rey before you were laid up?—Yes, a woman had died; her name was Anna Gallinha.

183. When was Luis Briza taken ill?—I am not sure, but I think not until fever had become general in the town.

184. Were you ever on board the "Eclair?"—No, never.

185. Have you always had good health until lately?—Yes, always, until after the "Eclair" left this island.

186. Have you ever been at St. Jago or any of the other islands?—I was four months in the Island of Sal in 1839. I have never been at any of the other islands except Sal.

Manoel Antonio Alves, private soldier, a negro, native of Boã Vista, aged 18, examined.

187. You were, I believe, at the Fort Duke of Braganza, when the sick of the "Eclair" were there?—Yes, I was.

188. Who was there with you?—When I was there as a guard, Corporal Vincente da Cruz Silva.

189. You state that they were with you when you were there as a guard; were you there in any other capacity?—Yes, I was sent there by the Commandant to bury the bodies of the Portuguese soldiers who died there after the "Eclair" had left the island.

190. How long were you at the Fort as a guard?—Four or five days.

191. Were you and your comrades quite well when you were relieved?—Yes, we were all well.

192. You have stated that you were ordered to bury the bodies of the two Portuguese soldiers who died at the Fort after the departure of the "Eclair;" who assisted you in this duty?—Joaquim Farenga and Manoel Luis, private soldiers, accompanied me in the boat from Porto Sal Rey to the island. I took off all my clothes, and left them in the boat with my comrades. I then ran up to the Fort, in a state of nudity, and there saw Pedro Manoel and Miguel Barbosa, private soldiers, on duty at the Fort.

192*a*. On this occasion did you find both the Portuguese soldiers dead?—No, Corporal Agostinho was dead, and private Joao Alexandre Roque, the other Portuguese, was very nearly dead.

193. Who assisted you to convey the body of the Corporal to the boat?—Pedro Manoel, Miguel Barbosa, and I, rolled the body up in a red quilt. The body looked very bad, and smelt most offensively; we then put two pieces of board under the body, and in this way carried it to the boat.

194. Where did you take the body to?—We took it about a mile and a half to the southward of Porto Sal Rey, and buried it in the sand on the beach.

195. When did Joao Alexandre Roque die?—The day after the corporal.

196. Did you also bury his body?—Yes.

197. Were you on this occasion again assisted by the same comrades you had before?—Yes, I was accompanied by the same soldiers, and Miguel Barbosa and Pedro Manoel assisted me to carry the body to the boat, and we buried it in the same manner as we had done that of the corporal.

198. When you had buried both bodies did you and your comrades return to Porto Sal Rey?—Yes, we did.

199. How long did you remain at this time at Porto Sal Rey?—Only an hour or so; for the Commandant ordered me to go again to the Fort as a guard.

200. On this second occasion on which you were sent as a guard, whom did you relieve?—Miguel Barbosa and Pedro Manoel.

201. Who accompanied you as your comrades in the guard?—Lorenzo Samed and Pedro Gonzalves, both private soldiers.

202. On this occasion where did you sleep?—We slept in the same room which had been occupied by the sick of the "Eclair."

203. Had this room been in any degree cleansed since the departure of the "Eclair?"—Yes, it was whitewashed, and some gunpowder was exploded in it after the death of Corporal Agostinho and the other Portuguese soldier.

204. How long did you remain with this guard?—Only a day and a half.

205. Were you and your comrades relieved at this time?—No, I was taken sick, and my comrades hoisted a signal to that effect; whereupon the barrack boat was sent from Porto Sal Rey, and took me to the barracks.

206. Where were you lodged in Sal Rey?—In a back room in the barracks.

207. How long did Lorenzo Samed and Pedro Gonzalves remain at the Fort?—I do not know, but they were both taken with fever, and Pedro Gonzalves died.

208. How long were you ill at the barracks?—Only four or five days very ill. I was weak a much longer time.

209. Have you ever been at any of the other islands?—Yes, I was at San Mayo, at San Jago, and at Sal, in the year 1841.

210. Were you sick at either of these islands?—No, never.

211. Has your health been in general good?—Yes.

212. Were you ever on board the "Eclair?"—No.

Third Guard at the Fort.

Miguel Barbosa, private soldier (negro), native of Boã Vista, aged 30. examined.

213. Were you at the Fort on the small island when the sick of the "Eclair" were there?—Yes, I was.

214. How long were you there before the "Eclair" people left the island?—I am not quite sure, but I think about six or seven days.

215. Did many of the "Eclair" people die while you were there?—Yes, a good many. I recollect that five died in one day.

216. How long did you remain at the Fort after the "Eclair" left Boã Vista?—Several days.

217. Some of you were taken ill on this guard—who was first attacked?—Corporal Joaquim Agostinho.

218. How long after the "Eclair" sailed was it that he was attacked?—The day after the steam-vessel sailed from Boã Vista.

219. When was João Alexandre Roque attacked?—On the same day as the corporal.

220. How long were they ill?—The corporal died on the third day, and Roque on the fourth day from being attacked.

221. What did they complain of?—First, general fever; then delirium; afterwards constant black vomiting.

222. Did you assist in carrying their bodies to the boat for the purpose of burial?—Yes, I did. I assisted Manoel Antonio Alves.

223. What room in the Fort did you and the Portuguese soldiers occupy when you first went there?—We occupied the cook-house underneath the piazza; but we occasionally went into the room that had been used by the sick of the "Eclair."

224. You mean after the "Eclair's" people left?—Yes; before and after.

225. Was this room cleansed in any way immediately after the "Eclair's" people left it?—The same day the "Eclair's" people left the island, I was ordered by Corporal Agostinho to sweep it out, which I did. On this occasion all three of us were in the room.

226. What became of the clothes of the corporal and Roque after their death?—They were thrown into the sea the day on which the soldiers died.

227. By whom?—By Manoel Antonio Alves.

228. Who, besides the guard, saw the Portuguese soldiers?—Doctor Almeida visited them once, and Portajo, the slave of Mr. Joao Baptista, also saw them.

229. Where did the corporal die; I mean, in what part of the Fort?—A day before he died he removed to the room where the "Eclair's" people had been, and he never left it until he was carried out.

230. Where did Roque die?—Under the piazza.

231. When you were relieved where did you go to?—To a house in Pao de Varella.

232. Were you much visited in this house?—Yes; Anna Gallinha and Joanna Texeira were usually in this house.

233*a*. Where did you go to after you left the house in Pao de Varella?—To the barracks in Porto Sal Rey.

234*a*. When were you laid up?—I was still complaining when I went to the barracks, and was laid up in bed the next day.

235*a*. In the barracks?—Yes.

236*a*. How long were you in bed?—Three or four days.

237*a*. Did your comrades visit you?—Yes.

238*a*. Was any one then sick in the barracks?—Yes; Luis Briza.

239*a*. Do you know when the gunpowder was exploded in the Fort?—It was smoked (the Fort) by Antonio da Pinha, Antonio Santos, and Manoel Antonio Alves, while I was there. It was not whitewashed until afterwards.

240*a*. Have you ever been away from the island?—Yes, I was four years at Porto Praya in St. Jago, and returned two years since.

241*a*. Have you always had good health?—Always until I had the fever lately.

Pedro Manoel, private soldier (negro), native of San Antonio, aged 30, examined. Not the man who belonged to the First Guard.

233. You are a native of the neighbouring island San Antonio; how long have you been here?—Only seven or eight months.

234. Were you at the Fort during the time the crew of the "Eclair" were there?—No, I was not there while the "Eclair's" crew were there. I was sent by the Commandant to attend the Portuguese soldiers who were taken sick after the "Eclair" sailed from Boã Vista.

235. How long did you attend them?—Upwards of three days.

236. What did they complain of?—They could not eat nor drink. they had vomiting of a black-looking stuff, and they talked foolishly.

237. Were they visited by a medical man?—Yes, Dr. Almeida saw them; but only once.

238. Did any one else besides Dr. Almeida see them: I mean any one from Porto Sal Rey?—Yes, another man; a slave belonging to Joao Baptista; his name was Portajo.

239. Do you know if he got fever?—I know he got fever, but I do not know at what time he died.

240. How long did you remain at the Fort after the Portuguese soldiers died?—About four days.

241. Were you at all unwell during these four days?—I was not quite well; and the Commandant fearing my comrade and myself might have fever about us, did not allow us to return to the barracks at Porto Sal Rey, but put us both into a small house in Pao de Varella.

242. How long did you remain in this house in Pao de Varella?—Seven or eight days; we then went to the barracks. In three or four days more I was taken ill with general fever, and then lived in the house of Manoel Joana, a storekeeper, when I was laid up in bed fifteen days; I had black-vomit, and was visited by the doctor of the Governor-General.

243. Were you visited by your friends when in the house of Manoel Joana?—Yes.

244. When you and your comrade Miguel Barbosa, were in the house at Pao de Varella, were you visited by any one?—Yes, by a great many; in particular by Anna Gallinha, a Portuguese woman, who cooked for us. Another woman, Joanna Texeira, was also constantly in the house.

245. What articles of clothing did you bring with you from the island?—We brought nothing from the Fort but the clothing on our backs. The first day we came to the house we stripped this clothing off, and gave it to the wife of Silvester José Romess, a mason, to be washed.

246. You are quite sure you brought no other articles of clothing from the Fort, except those you had on your back?—I am quite sure that neither Miguel Barbosa nor myself had any other articles of clothing.

247. What clothing did you wear while those you had on when you came from the Fort, were being washed by the wife of Silvester?—Some other clothes we had at Porto Sal Rey. They were brought to us by a man called Antonio Lopez, who is now dead.

248. Do you know when the rooms at the Fort were whitewashed?—I do not know when they were whitewashed; but I believe they were some days after the soldiers died—not while we were at the Fort.

249. Have you in general enjoyed good health?—Yes, always, until I had the fever.

249*a*. Are you quite sure that neither of the Portuguese soldiers was ever on board the "Eclair?"—I am quite sure they never were.

Manoel Joana, a mulatto, native of San Nicolao, aged 45, examined. It was in this man's house that Pedro Manoel was laid up with fever for a fortnight.

250. How long have you been in this island?—Since I was a child.

251. What is your trade?—I am a storekeeper (grog-shop-keeper).

252. When did Pedro Manoel come to your house sick?—After he had been in the house at Pao de Varella.

253. Who attended him?—I nursed him; and he was seen by the Governor-General's doctor.

254. How long was he in your house?—About a fortnight.

255. What did he complain of?—Headache and fever all over; he had also much vomiting.

256. Did many of his comrades visit him?—Yes.

257. When did you get the fever?—When the soldier was recovering; my wife was also taken ill after me.

258. You both soon recovered?—Yes.

Fourth Guard at the Fort.

This guard is not contained in the return of the Commandant. It consisted of—

Manoel Alves, private,
Lorenzo Samed, ditto,
Pedro Gonzalves, ditto.

Alves, it will be recollected, belonged to the Second Guard, and had also been employed to bury the Portuguese soldiers who died at the Fort.

Lorenzo Samed, private, (negro) native of St. Jago, aged 21, examined.

259. You state that you are a native of St. Jago; how long have you been at Boã Vista?—Eight or nine months.

260. What guard did you relieve at the Fort?—With Manoel Alves and Pedro Gonzalves, I relieved Miguel Barbosa and Pedro Manoel.

261. How long were you at the Fort?—I think about twelve or thirteen days.

262. When was Manoel Antonio Alves taken ill?—After we had been there about two days.

263. When was Pedro Gonzalves taken ill?—He was not taken ill until the first of our returning from the Fort to Porto Sal Rey.

264. Where did you and the rest of the guard sleep when at the Fort?—In the room next to that in which the Portuguese soldiers died.

265. Do you know when the room in which the soldiers died was cleansed?—I do not; but I know that it was cleansed some time after they died.

266. When were you attacked with fever?—Two days after I returned from the Fort to Porto Sal Rey.

267. Was fever general in the town when you and Pedro Gonzalves were laid up?—Yes.

268. Who relieved you at the Fort?—Andre Vass and Jose Sancha.

269. Had you ever fever when at St. Jago?—No, never.

270. Had Pedro Gonzalves or yourself ever been on board the "Eclair?"—No.

Fifth Guard at the Fort.

This guard consisted of *Andre Vass*, private, (negro) native of the Island of St. Jago, and *Jose Sancha*, private, (negro) native of San Antonio.

Andre Vass, private, aged 35, examined.

271. How long were you at the Fort before you were taken ill?—I was not taken ill until I had returned to Porto Sal Rey. Jose Sancha was attacked after we had been at the Fort only three days.

272. After Jose Sancha was taken ill, what did you do with him?—He remained several days ill; and at last a boat came and took us both away from the small island.

273. Did any one relieve you?—No one.

274. What room in the Fort did you occupy?—All parts of the Fort.

Jose Sancha, private, aged 20, examined.

275. When were you sent to the Fort Duke of Braganza on the small island?—I was sent with Andre Vass.

276. Were you ever at the Fort while the sick of the "Eclair" were there?—No.

277. How long were you at the Fort?—I was taken ill on the third day after I was there, and remained some days longer.

278. Where were you put on your return to the barracks at Porto Sal Rey?—In a room behind the barracks.

279. How long were you sick at the barracks?—About six days.

280. What did you complain of?—I had a severe headache; hot all over, and severe vomiting.

281. Did any medical man attend you?—Yes, I was seen by Dr. Almeida.

282. Were you ever on board the "Eclair?"—No, never.

283. Was there any fever in the town before you went as a guard to the Fort?—Yes.

N.B. Not one of the soldiers were ever on board the "Eclair;" see letter to that effect from Major Mascarenhas, the Military Commandant.

J. O. Mc W.

6A.—Evidence relative to the visitors of Miguel Barbosa and Pedro Manoel, private soldiers, while in the house at Pao de Varella after their return from the Fort.

John Jamieson called in and examined.

284. Do you know anything about those who visited Miguel Barbosa and Pedro Manoel while in the house at Pao de Varella after they returned from the Fort?—To my knowledge they were visited by a great many people, in particular by Anna Gallinha, a Portuguese woman since dead; Anna Texeira, a native; Silvester Jose Romess, and his wife.

285. Was Anna Gallinha attacked with fever?—Yes, she was; and hers was the first case that excited any apprehension, or indeed attracted any notice in Porto Sal Rey. I am aware that Justinian was sick some considerable time before this, and so was Corporal Perez. I also heard something of Anna Gaspar being unwell; but little if any attention was paid to the reports of the illness of any one until Anna Gallinha showed strong and suspicious symptoms. She was the first person that died from fever in Porto Sal Rey.

286. How long was Anna Gallinha sick? Only four days.

287. You mention suspicious symptoms, what were they?—High fever, wildness, and black vomit.

288. Did any medical man see her?

289. Was she visited by others?—Yes, by many. Joanna Texeira attended her as nurse. Manoel Affonso, a labourer, also was often in the house.

290. About what time was Anna Gallinha taken ill?—I am not quite sure, but I think about the 12th October last year.

291. Had she ever been on board the "Eclair" or at the Fort while the sick were there?—No, I am sure she never was at either.

292. Was Joanna Texeira taken ill? Yes, she was, about a week or ten days after Anna Gallinha's being taken ill.

293. Was she very ill?—No, not very ill; she was weak a long time after the fever left her.

294. Who attended Joanna Texeira?—Dr. Kenny as medical attendant, and her own son as nurse.

295. Was her son taken ill?—Yes, a few days after he had been acting as nurse to his mother.

296. How long was he ill?—Not more than five or six days.

297. When was Dr. Kenny taken ill?—Not until a considerable time afterwards.

298. When was Manoel Affonso laid up?—He was taken ill the day after Anna Gallinha died.

299. Do you know if Manoel Affonso had ever been on board the "Eclair," or at the Fort?—I am sure he had not been on board the

"Eclair," nor was he ever at the Fort while the sick of the "Eclair" were there.

300. Had he seen Justinian or Corporal Perez?—I think he may have seen Justinian, but I am not at all sure.

301. How long was Manoel Affonso ill?—He died after four days' illness.

302. Do you know any one who attended or visited Manoel Affonsò during his illness? Yes, I know he was a good deal visited by a man called Luis Ignes, who is now at San Antonio.

303. Was this man not on board the "Eclair?—Yes, he was.

304. Was he taken ill?—Yes, shortly after the death of Manoel Affonso; he was attended by Dr. Kenny, and recovered.

305. Were there any other visitors?—Yes, Gertrude Bent, her next-door neighbour; she was taken ill, and soon died.

306. Did all those you have mentioned as having been taken ill, live in Pao de Varella?—Yes, all of them.

307. Do you know anything of the woman who washed the clothing of Pedro Manoel and Miguel Barbosa, the soldiers who after returning from duty at the Fort on the small island, were for some time lodged in the house at Pao de Varella?—Yes, she is the wife of Silvester Jose Romess, a mason in Pao de Varella.

308. Was she or any one in the house taken ill after receiving the clothes?—Yes, she was; and so was Silvester himself.

309. When was Silvester taken ill?—I am not quite sure, but it was about the same time as Anna Gallinha was.

310. Was Silvester seen by any medical man?—Yes, she was attended by the late Dr. Kenny, and I think Dr. Almeida also saw him.

311. How long was he sick?—I do not know how long, but he was a long time poorly.

312. Do you know if he ever was on board the "Eclair" or at the Fort?—He was not at either.

Silvester Jose Romess, negro, native of San Nicolao, aged 33, examined.

313. How long have you been on the island?—Thirteen years.

314. Have you always enjoyed good health during that period?—Yes, always, with the exception of a severe cold I had nine years since, and an attack of fever I had after the steam-vessel "Eclair" left the island.

315. When were you attacked with the fever?—I do not know the date, but I was taken ill about the same time as Anna Gallinha was. I had fever when she died.

316. Did you visit any house where there was fever?—I never went into any house where there were sick, except to see Pedro Manoel and Miguel Barbosa, when they were in the house at Pao de Varella, after their return from the Fort on the small island.

317. Did your wife receive the clothes of the two above-named soldiers to wash them?—Yes, she received them the day they came from the island.

318. How long after your wife received the clothes was it that you were taken ill?—Three days; it might be a day or two more.

319. How long were you ill?—Nearly two months.

320. Was any one else in your house, besides yourself, taken ill with fever?—Yes, my child, ten years old, and my niece, sixteen years old, lastly my wife.

321. How long after you were taken ill were the children attacked?—About fifteen days.

322. And your wife?—Not until four or five weeks afterwards.

323. Your wife was a good deal in the house where the soldiers were at Pao de Varella?—Yes, she was.

324. Was she in other sick houses?—Yes, many.

325. Did your wife and children recover?—Yes, my wife, child, and niece all recovered.

326. Did any one else in your house take ill?—Yes, a man named Luis Barros was taken ill in my house early in November. This man was taken ill immediately after he had buried a fever corpse on the beach.

327. Had Barros ever been on board the "Eclair" or on the Fort?—No, never at either.

328. Was there any one else ill in your house?—Yes, a boy who left the island with Mr. Pettingal and family, and returned to Boã Vista in the same schooner (in which by this time Mr. Pettingal had died of fever at San Nicolao) was brought to my house ill with fever, and died in eight days with vomiting and dark bloody stools.

329. Was this boy a visitor at your house before he left the island with the late Mr. Pettingal?—Yes, he was; and I was at the time sick.

330. Do you know if any sailors died on board this schooner?—I have heard that one sailor died on board.

331. Can you recollect who were sick at the time you were taken ill?—Anna Gallinha and Manoel Affonso were both ill at the time, and so was Gertrude Bent.

332. Were they the first in Porto Sal Rey that were taken ill?—I think they were. Before that I heard of Corporal Perez being ill, but I did not see him. I forgot to say that I once saw Justinian when he was ill.

333. Did the soldiers look ill, when they were in the house at Pao de Varella?—Yes, particularly Miguel Barbosa.

Joanna Texeira, a mulatto, native of San Antonio, aged 59, examined.

334. How long have you been on this island?—Sixteen years.

335. Where do you live?—In that part of Porto Sal Rey called Pao de Varella.

336. Do you recollect when the soldiers Miguel Barbosa and Pedro Manoel came to the house in Pao de Varella on their return from the Fort?—Yes, I lived in the next room to them.

337. Were they sick?—They were not in bed, but they both complained, and were restless and had headache; they looked ill.

338. Do you know what clothes or other articles they brought from the Fort? Only the clothes they had on their backs, and a flag.

339. Do you know who washed the clothes they wore when they came to your house?—The wife of Silvester Jose Romess.

340. When did she get the clothes?—Immediately after they came to the house.

341. Did she come for the clothes?—Yes.

342. Do you know if any one was taken ill in Silvester's house?—Yes; Silvester himself, his wife, and children.

343. Did Anna Gallinha visit the house in which the two soldiers were?—Yes, she lived in the same room with me; in fact, in the same house, for my room was next to that of the soldiers. Anna Gallinha also cooked for the soldiers.

344. When was Anna Gallinha taken ill?—Just after the soldiers left the house; it might be several days.

345. Was she taken ill in your house?—Yes, she was.

346. How long was she ill?—Only four days.

347. Had she black vomit?—Yes, constantly, for some hours before she died.

348. What did she complain of at first?—Headache, fever, and pains all over.

349. Was Anna Gallinha visited by many during her illness?—Yes, by several.

350. Can you give me the names of two or three of those who visited her during her sickness?—Silvester's wife, Piedad Angelica, and my son, a boy of sixteen.

351. Were you taken ill?—Yes, I was.

352. When were you taken ill?—Three days after Anna Gallinha died.

353. Was your boy attacked?—Yes, about eight days after Anna Gallinha's death.

354. He recovered?—Yes, after only a week's illness.

355. Was Piedad Angelica taken ill?—No, but her family consisting of five or six children were all attacked.

356. Do you mean about the time you were ill?—No, not until the fever was general in Porto Sal Rey.

357. Now, to the best of your knowledge, who was first attacked with fever in Porto Sal Rey?—Anna Gaspar and Rosinha Santo Antao. I am not sure, but I think Justiniano was ill before they were.

358. Did you visit Anna Gaspar and Rosinha Santo Antao?—Yes, I did.

359. Did Anna Gallinha visit them?—No.

360. What sick people did Anna Gallinha visit before she was taken ill?—I am quite sure she saw no sick persons except Miguel Barbosa and Pedro Manoel when they were in my house.

361. Can you tell me when Anna Gaspar and Rosinha Santo Antao were taken ill?—No, I cannot, but it was some time before Anna Gallinha was attacked.

362. Who was next ill after Anna Gaspar and Rosinha?—Anna Gallinha.

Anna Gaspar, a mulatto, native of San Antonio, aged 25, examined.

363. How long have you been on this island?—Nearly four years.

364. Have you always enjoyed good health during that period?—Yes, always, until the steam-vessel the "Eclair" came here, when I got fever.

365. When did you get fever?—I had a slight attack of fever four or five days after the "Eclair" sailed.

366. How long were you ill?—About a week.

367. Had you been to see any sick people?—No.

368. Were you ever on board the "Eclair" or at the Fort on the small island?—No.

369. Did any of the people belonging to the "Eclair" visit your house?—Yes, several.

370. Blacks or Whites?—Two whites, who remained about an hour, and several blacks; this was while the sick were at the Fort.

371. Where is your house?—At Pao de Varella.

372. Have you had any illness since your attack of fever?—Yes, after I got well I went and saw several who were sick, and I got ill again.

373. How long were you ill the second time?—Only a few days.

374. Did you visit Anna Gallinha during her illness?—Yes, I saw her on the day she died.

Rosinha Santo Antao, a mulatto, native of San Antonio, aged 19, examined.

375. Were you in Porto Sal Rey when the "Eclair" was here?—Yes, I was.

376. Have you been ill since the "Eclair" came here?—Yes, I was ill at the same time Anna Gaspar was.

377. How long were you ill?—About a week.

378. What did you complain of?—Headache, and pain of back with general fever over the body.

379. Were you visited by any of the "Eclair's" people?—Yes, occasionally.

380. Have you in general had good health?—Yes, always, until I had the fever.

Pulcherra Gertrude, mulatto, native of Boã Vista, aged 30, widow of the late Antonio Perica, examined.

381. When was your late husband taken ill?—He was taken ill two days after he carried the corpse of Anna Gallinha and of Manoel Affonso to Rabil.

382. How long was he ill?—Seven days.

383. Had he ever been on board the "Eclair" or at the Fort?—No, he arrived from Madeira after the "Eclair" had left the island.

384. Had he much fever?—Yes, and vomiting.

385. What was the colour of the vomited matter?—Yellow.

386. How many were there in your house?—At first only my husband and myself.

387. Then were you taken ill?—Yes, I was, in about a week after he died.

388. Was any one else taken ill in your house?—Yes, a girl and a man called Eusebio da Luz, who came to attend my husband.

389. Did either of them die?—Yes, Eusebio da Luz died.

390. Are you sure he had not been on board the "Eclair" or at the Fort on the small island?—I am sure he never had. He however saw Manoel Affonso during his illness.

6B.—*Evidence of Justinian da Silva Georgio, spirit-storekeeper in Porto Sal Rey, whose house was resorted to by the petty officers, &c. of Her Majesty's ship "Eclair," when on leave shortly after the vessel arrived at Boã Vista.*

Justinian da Silva Georgio, storekeeper, native of Boã Vista, aged 30, examined. (Porto Sal Rey.)

391. You, I believe, keep a spirit-store in Porto Sal Rey?—Yes, I do.

392. Were you visited by the people of the "Eclair" when they were at Porto Sal Rey on leave?—Yes, there were at least ten or twelve of them in my house.

393. How long did they remain at your house?—They were out and in until the evening. One man was ashore two days.

394. Do you recollect when it was that the men got leave?—I do not, but I think the crew were then at the Fort.

395. Did the man whom you mentioned as having slept on shore remain in your house?—No, he was somewhere in Pao de Varella.

396. It has been stated that you had fever about this time, was it so?—Yes, I had a headache and fever the evening of the day on which the sailors came to my house.

397. You are quite sure it was the same evening?—I am quite sure.

398. How long were you ill?—About a fortnight.

399. Where were you when you were ill?—In my own house.

400. Did many people see you while you were ill?—Yes, several saw me, and Doctor Almeida attended me.

401. Do you recollect the names of any others who visited you?—Yes, Anna Gaspar, Rosinha Santo Antao, Maria Nazarinha, José Antonio, Joaquim Lima, and others.

402. Were you not complaining a little before you were visited by the sailors?—Not in the slightest.

403. How were you employed for the month preceding that in which the "Eclair" came here?—I was as usual in my shop.

404. Have you always had good health until lately?—Yes.

405. Do you know who first died of fever at Porto Sal Rey?—Yes, I do. First, Anna Gallinha; then Manoel Affonso; then Maria Nazarinha; then Gertrude Bent; then Antonio Perica, then Lisboa, a writer;—all these lived near to each other in Pao de Varella.

7.—*Evidence of Senhor Ignacio Carvahal, merchant in Porto Sal Rey, relative to the origin and progress of the fever there.*

Senhor Ignacio Coreia Carvahal, native of Boã Vista, aged 56, merchant in Porto Sal Rey, examined.

406. Were you here when the "Eclair" arrived from the coast of Africa in August last?—Yes, I was.

407. Who was the first person you heard of as being sick during her stay or after she had gone?—I never heard anything of the sickness until Anna Gallinha and Manoel Affonso were taken ill. I heard that Manoel Affonso had in his possession a coverlet or blanket which had belonged to the "Eclair."

408. What was Manoel Affonso?—A labourer.

409. Do you recollect who was next attacked?—I think Anna Nazarinha, and next Lisboa the writer.

410. You lost a son, I hear?—Yes, I lost a fine boy of 18, who died of fever.

411. Was he ever on board the "Eclair" or at the Fort?—No, never at either.

412. Had he been among sick people?—Yes, he was with Lisboa, but he never saw any other sick person.

413. Did he remain long in Lisboa's house while Lisboa was sick?—He was there during two nights.

414. How long was Lisboa ill?—I think about six days.

415. When was your son taken ill?—He was taken ill the day Lisboa died.

416. How long was your son ill?—He died on the seventh day.

417. Was he ill in your house?

Second examination of *Senhor Ignacio Coreia Carvahal.*

418. Were you here when the "Eclair" was here?—I was.

419. You had some launches employed coaling and watering that vessel?—Yes.

420. Did you hear of any one being sick while the "Eclair" was here?—No.

421. Then who was the first person you heard of as being ill?—I did not hear of any one being ill until Anna Gallinha and Manoel Affonso were sick. I heard that Manoel Affonso had in his possession a coverlet which had belonged to some one in the "Eclair."

422. Did you know anything of Anna Gallinha?—I only heard of her as a Portuguese woman who had attended and cooked for Miguel Barbosa and Pedro Manoel, the soldiers who came from the Fort.

423. Do you know of any others who were sick about this time?—Yes, Maria Nazarinha and Lisboa the writer.

424. I understand you lost a son from fever?—Yes, I lost a fine boy eighteen years of age.

425. Had your son ever been on board the "Eclair" or at the Fort, or in any way had communication with the "Eclair?"—No, never.

426. Had he been at all among sick people?—Yes, he was a great friend of Lisboa's, and was during two nights in his house during his illness. He was taken ill the day Lisboa died.

427. Had your son not seen any other sick person besides Lisboa?—No, no one.

428. How long was Lisboa ill?—Six days.

429. How long was your son ill?—Six or seven days. He died on the 4th of November.

430. How many persons are there in your house in Porto Sal Rey?—About thirty persons inclusive of slaves.

431. Did any one in your house besides your son have fever?—No.

432. Who nursed your son?—My wife and daughter.

433. Have you had the fever?—No, not lately; but I had a fever, with black vomit, in 1817, at the Island of San Domingo in the West Indies.

434. How long have you been in this island?—I have been here nearly all my life; and I am now 56 years of age.

435. During what years have you ever known fever to prevail here?—I have never known fever to prevail anywhere in this island, except at Rabil.

436. Then at what times has fever prevailed there?—There was fever at Rabil in 1821 and the beginning of 1822.

437. Have you any idea how many died at that time?—About thirty persons.

438. When was the next visitation of fever?—In 1827.

439. How many died then?—I do not know: but there were very few deaths.

440. When was the next visitation?—In 1833 there were some attacks of intermittent, but few, if any, deaths took place.

441. Do you mean to say that all the visitations of fever which you have mentioned were confined to Rabil?—Yes, I am quite sure they were; for people came to Porto Sal Rey and to the other parts of the island to avoid fever, and they succeeded.

442. Have you never had fever in Porto Sal Rey?—Never, until after the departure of the "Eclair."

443. You have been at Porto Praya in St. Jago?—Yes.

444. Have you been there during the prevalence of the fever?—Yes.

445. Were you attacked?—No.

446. Have you ever known the fever of St. Jago to be taken to any of the other islands?—No; no one ever considers it to be infectious, and no one fears it who is not at St. Jago.

8.—*Evidence of Senhor Joao Baptista, proprietor of salt-works, &c. in Boã Vista, relative to the fever in Porto Sal Rey, Boaventura, &c.*

Mr. Joao Baptista, Acting Vice-Consul, native of Boã Vista, aged 38, examined.

447. Were you here during the time the "Eclair" was here?—Yes. I supplied the ship's company with fresh provisions.

448. When did you hear that sickness had appeared on the island?—When Anna Gallinha, Silvester Jose Romess, and Manoel Affonso were ill.

449. You were aware that two European soldiers died at the Fort on the small island?—Yes; but we did not expect that the sickness would go any further.

450. How do you think the sickness got to Porto Sal Rey, or rather to that part of it called Pao de Varella?—By the negro soldiers who came from the Fort after the Portuguese soldiers died.

451. About what time did the sickness begin to excite alarm in Porto Sal Rey?—About the middle and towards the latter end of October.

452. Did you remain in Porto Sal Rey during the whole time of the sickness?—No, I left it on the 19th of November.

453. Where did you go then?—To my house at Boaventura.

454. Had any person in your house been taken ill by this time?—Yes, two of my slaves; one of them called Portajo died.

455. Was there any sickness in Boaventura when you went there?—My brother-in-law, Mr. Antonio da Graça Pinto, died on the 20th November there, but I do not know that there were any others sick at this time.

456. Was there much fever in Cabeçada at this time?—Yes.

457. Was there much intercourse between the Cabeçada people and the people of Boaventura?—No; we did not allow the Cabeçada people to come near our houses.

458. Did you hear anything of a slave having gone in the night-time from Boaventura to Cabeçada?—Yes, I did.

459. How long did you remain in Boaventura?—Until the 1st of January, when I returned with my family to Porto Sal Rey.

460. Was any of your family attacked after your return to Porto Sal Rey?—Yes, two of my slaves, called Domingos and Zacharias; my wife and five children were also attacked about this time: they recovered.

461. How many persons are there in your house?—Forty-two persons, including slaves.

462. At what time do you consider that fever was at its height in Porto Sal Rey?—In November. Sometimes eight died in one day.

463.—When was it greatest in Cabeçada?—In November and part of December.

464. When at Boaventura? — From the middle of December to January.

465. When did the Europeans begin to leave the island?—Some of them went away in October. In November General Norronha, and nearly all the Europeans who could leave the island, did so. The English Consul was here until the 2nd December, when he left for San Antonio.

9.—*Evidence of Vicente Antonio Oliveira, Carpenter, relative to the Fever in Boaventura and in the Eastern Villages.*

BOAVENTURA.

Vicente Antonio Oliveira, mulatto, native, carpenter, aged 30, examined.

466. Were you at Boaventura when the fever appeared at Cabeçada?—Yes, I was.

467. Can you tell me when the fever did appear at Cabeçada?—I cannot, but Joaquim Marques died on the 29th October; and as I heard there was more fever in Cabeçada, I thought it best to leave the place, which was so near to an unhealthy district, and accordingly, left on the 3rd November, and went to João Gallego, one of the northern villages.

468. Then, was there no fever in Boaventura when you left it on the 3rd November?—No.

469. How do you account for there being no fever in Boaventura, seeing that it prevailed in Cabeçada, which is only a few hundred yards from it?—We were careful in not allowing the Cabeçada people to have intercourse with those of Boaventura, and the Boaventura people took good care not to go to Cabeçada.

470. Did the Cabeçada people not come into the town?—Yes, they sometimes passed through the town, but they were not allowed to go into any of the houses.

471. How long do you think fever was prevented by the precautions you adopted?—The first case that I am aware of having taken place at Boaventura was that of Senhor Antonio da Graça Pinto, the brother-in-law of Senhor João Baptista; he was brought from Porto Sal Rey, sick, about the 15th of November, and died on or about the 20th of the same month.

472. Was there any other case about this time?—Yes, there was the case of Rosa Fortes, the servant of Mrs. Pettingal, who came home sick to her father's house in Boaventura, about this time.

473. Was any person taken ill in the house of Rosa's father?—Yes, all in the house were attacked with fever.

474. Do you know of any other case about the same time?—Yes, a slave belonging to Cecilia da Britho went by stealth in the night-time from Cabeçada to Boaventura, to see a friend or relation of his; he was

taken ill at Boaventura, and died in four or five days' illness. The fever spread from Rosa's father's house and the house where this slave died.

475. Do you know in whose house this slave died?—Yes, it was in the house of a woman called Ambrosia, who also was soon taken ill and died.

476. Well, you went to João Gallego; how did you find all there?—I found that two soldiers had only the day before arrived from Porto Sal Rey, and that they both had fever.

477. Then did you remain, notwithstanding the soldiers were there with fever?—Yes.

478. Seeing that you had left Boaventura to avoid fever, why did you not for the same reason leave João Gallego, when you found fever there?—I had removed my family of eight persons and all my furniture; moreover I had lent my house to another person, and had nowhere else to go.

479. How long was it before any one in the village was taken ill after the arrival of the soldiers?—I am not sure how long, but the mother of one of them called Antha Cotta was soon afterwards attacked and died.

480. Who was the next attacked?—A woman called Rufina Mends.

481. Had Rufina been in Antha Cotta's house?—I do not know, although I think it very probable, as they lived very near to each other.

482. Did Rufina die?—Yes, and another girl in the same house.

483. When was your family attacked?—My mother was first attacked and she was taken ill on the 6th of January, 1846.

484. How did you escape so long, and the fever in the same village?—We adopted great precautions; we never visited sick people, and scarcely spoke to any one.

485. How did the fever reach you after all?—It by degrees travelled to our next-door neighbours, and we were then attacked.

486. How many of your family had fever?—All, except my wife.

487. Did you all recover?—Yes.

488. When did you return to Boaventura?—On the 20th January, 1846.

10.—*Evidence of Lieutenant Joaquim José dos Santos, of the Artillery Battalion of the Cape de Verds, relative to the fever in various parts of the Island of Boã Vista.*

Lieutenant Joaquim José dos Santos, of the Artillery Battalion of the Cape de Verds, examined. Native of Portugal, aged 38.

489. Were you here when the "Eclair" arrived in August last?—No, I arrived here from the Island of Sal on the 24th of November last.

490. In what state did you find the island with regard to health?—I found Porto Sal Rey, and Cabeçada, (Rabil,) with much fever.

491. Were the soldiers sick at this time?—Yes, nearly all of them were laid up.

492. How long did you remain in Porto Sal Rey?—I did not leave it, except for a few days, when I went to see people ill at Cabeçada, and afterwards at the northern villages.

493. Do you recollect about what time you went to Cabeçada?—Yes, it was about the 24th of November.

494. Was there any sickness in Boaventura at this time?—I do not know; I did not hear of there being any sick there.

495. Did you go into any of the houses in Cabeçada where there were sick?—Yes, I went into a great many houses where there were sick.

496. When did you go to the northern villages?—I went there on the 29th of November.

497. What state did you find the villages in?—In Cabeça dos Tharafes I found many sick; at Fundo das Figueiras only one sick; and I am not a ware that there were at this time any in João Gallego.

498. Did you return to these villages?—Yes, about the end of December.

499. What was their state then with regard to health?—João Gallego contained several sick; Cabeça dos Tharafes contained a great many sick; and the people at Fundo das Figueiras had established a cordon sanitaire between Cabeça dos Tharafes and their own village.

500. How was this cordon sanitaire formed?—It was formed by a guard of militia, who were called out for the purpose.

501. Then was Fundo das Figueiras quite healthy at this time?—No; there were several sick people in a house that had been converted into an hospital.

502. Did you at any time afterwards pay a visit to the northern villages?—Yes, I was there again on the 24th of February. At this time João Gallego contained about a hundred sick people. Fundo das Figueiras had also a number of sick. At Cabeça dos Tharafes the disease had abated, inasmuch as there were not more than five or six people sick there.

503. Was this your last visit to the villages?—Yes; on my return to Porto Sal Rey I had an attack of fever on the 2nd of March.

504. How do you think you got this fever?—When I was at João Gallego I took a son of Mr. Perfeira's in my arms; this boy died a few hours after I had thus supported him.

505. How long were you ill?—I had high fever seven days, and about three weeks of debility.

506. Has any one in your family been attacked?—Yes, all my family, consisting of seven persons. They all recovered.

507. How long have you been in these islands?—Nearly nine years.

508. Have you been at all the other islands?—Yes, I have been at all of them, with the exception of San Nicolao and San Antonio.

509. Have you been much at St. Jago?—I have been there very often, but never more than three or four months at a time.

510. Were you ever at St. Jago during an unhealthy period?—Yes, in July 1838, when I left St. Jago, there were a great many ill with the fever of the country.

511. Do you consider the endemic fever of St. Jago to be an infectious disease?—No.

512. Is it not generally considered to be so?—No.

513. Have you ever had fever on any of the other islands?—Yes, at Fogo I had an attack of intermittent, which troubled me more or less for fifty-three days.

514. Have you had any return of it since?—No; I have always been well since, up to the month of March last, when I caught fever here.

João Baptista, negro, native of Boã Vista, aged 28, examined.

This man was in no way connected with the "Eclair;" but his evidence is taken relative to the first appearance of fever in João Gallego, and as instance of escaping the fever by going into the country.

515. You belong to João Gallego?—Yes, I do.

516. When did you leave it?—Early in January.

517. How many left it with you?—In my own family, my mother and sister. There were however several others.

518. Where did you go to?—I went to a house on a hill called Montero.

519. How long did you remain there?—We are there still.

520. Have you or any of your family had fever?—No.

521. How did you escape, seeing you were until January in João Gallego, where the fever was raging?—We never went into any houses, and we avoided going near where there were sick.

522. Have you always enjoyed good health?—Yes, all of us.

Antonio Fidela, mulatto, native of Boã Vista, aged 35, examined.

This man was not connected with the "Eclair." He is examined with the same view as the former man was.

523. Were you at João Gallego when the fever first broke out?—Yes.

524. Who was first sick in João Gallego?—Two soldiers, who came from Porto Sal Rey.

525. Who was next sick?—Rufina, and Nicolao das Neves.

526. Have you been sick?—Yes, twice.

527. When had you the first attack?—About the 1st of February.

528. And the second?—After an interval of a fortnight.

529. Had you been in Porto Sal Rey before you were attacked?—Not for three weeks before I was taken ill.

530. Were there many sick in Porto Sal Rey when you visited it?—Yes, many; but I did not see any of them.

531. Did you see any of the sick at João Gallego before you were taken ill?—Yes, I attended my own sister, and she died.

532. How long was it after your sister died, that you were attacked?—More than a fortnight.

533. Had you seen any other sick people?—Yes, a great many.

534. How many are there in your house?—At present, my wife and one child only. I have four children, but I sent three of them away when the fever began, and they have escaped it.

535. Where did you send them to?—To a small house in the country.

536. Have your wife and child at João Gallego been attacked with fever?—Yes.

537. Did they recover?—Yes.

538. Have you and they in general had good health?—Yes.

Gustavus Fortes Varella, negro, native of Boã Vista aged 36, examined.
(Moradinha, or Santa Cruz.)

539. Were you at Moradinha when fever prevailed there?—Yes, I was.

540. Were you there when Luis Fortes Pathi was taken ill?—Yes, he was taken ill in my house.

541. How long did he remain in your house after he was taken ill?—Several days.

542. How many were there at that time living in your house?—Myself and wife.

543. Were you attacked?—Yes, and so was my wife; both about three weeks afterwards.

544. Who was first attacked at Moradinha?—First myself—then my wife; and next, a woman called Magdalena, who died.

545. Had she been all along in the village?—No, she had been attending a sick friend of hers in Pao de Varella.

546. Who was next taken ill?—Her brother; he also died.

547. How long were they ill?—Four or five days.

548. Did the fever attack the greater proportion of the inhabitants of Moradinha?—No, not one half were attacked.

549. How long have you lived in Moradinha?—Three years.

550. You have fever there occasionally?—Yes.

551. At what time of the year?—About the end of the year.

PART II.

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Labourers who were on board the "Eclair" from Porto Sal Rey.

Names.	Country.	Age.	How long on board.	If attacked with Fever, and when.	Result.
Eusebio Vicente	Native mulatto	26	8 days	Dec. 1845	Recovered
João Mariana	Do.	50	3 ,,	Nov. 27, 1845	Do.
Antonio Maria Simoa ..	Do.	25	8 ,,	Dec. 1845	Do.
Gregorio Tavares ..	African negro	25	14 ,, & in Loanda	Dec. 1845	Do.
Joaquim das Neves ..	Native negro	50	7 days	.. .. ..	Do.
João Joaquim Perez ..	Native mulatto	23	5 ,,	Jan. 1846	Do.
Luis Ignes					
Antonio Joana					
Pedro San Antonio ..	.. ..	..	..	. .. ..	Died

Eusebio Vicente, an Albino mulatto, native of Boã Vista, aged 26, examined.

552. Were you on board the "Eclair" when that vessel was here?—Yes, I was.

553. How were you employed on board?—Hoisting in coals and water.

554. Did you go below?—Not below the lower deck.

555. Were you at the Fort while the sick of the "Eclair" were there?—No.

556. Were you on board the day on which she sailed from Boã Vista?—Yes, I was.

557. Did you return to Porto Sal Rey every night while you were employed, and when she left Boã Vista?—Yes; to the house of my aunt near the Consul's (English) house.

558. Who, besides yourself, reside in the house of your aunt?—Cousins.

559. Have you had fever?—Yes, I was attacked in December last.

560. Had you been among sick people before you were attacked?—Yes; I likewise carried the corpses of two people who died of fever, to Rabil.

562. How long was it before you were taken sick that you carried the corpses to Rabil?—A month or six weeks.

563. Had you been visiting sick people very shortly before you were taken ill?—Yes, I saw a woman who had fever fourteen days before I was laid up.

564. Did your aunt become sick?—Yes; three days after me.

565. And your cousins?—Yes; one of them, a day before I was attacked.

566. Did you all recover?—Yes; all.

567. Have you ever been away from this island?—Yes, I was twelve years at San Antonio.

568. How long is it since you returned?—Nine months.

569. Have you in general enjoyed good health?—Yes, always, until I had the late attack of fever.

Joao Mariana, dark mulatto, native of Boã Vista, aged 50, examined.

570. How long were you employed on board the "Eclair?"—I was employed getting up provisions from below. I also baled out water from the lowest part of the vessel. I was three days on board.

571. Was this during the earlier or latter period of her visit here?—Shortly after she came in.

572. Where did you go to after you left the "Eclair?"—To my launch, which was employed coaling the ship,

573. Did you go on board while you were employed coaling?—Yes, frequently.

574. Were you at the Fort while the sick were there?—No; but I was every day on the island at the coal-heap.

575. Were you on board the day the ship sailed?—Yes.

576. When the sick were brought on board?—Yes.

577. Did you return to your house in Porto Sal Rey immediately the ship sailed?—Yes.

578. What family have you?—A wife and four children.

579. Were you taken sick?—Yes.

580. How long after the "Eclair" sailed?—On or about the 27th November.

581. Was your wife sick?—Yes.

582. Before or after you?—She was sick after I was.

583. And your children?—The children were all taken ill after my wife in succession, and one twelve years of age died.

584. Had you or your wife been to see sick people?—Yes, I have seen a great many, and cupped them. I am a doctor of this country.

585. How long were you ill?—Eight days.

586. How long was your wife ill?—A long time; she very nearly died.

587. How long was the child ill?—Only a few days, and it died.

588. Had the child that died black vomit?—Yes.

589. Had you, your wife, or the children who recovered, black vomit? No.

590. Have you ever been at St. Jago or at any of the other islands?—Yes, I have been at St. Jago three years ago.

591. Had you fever while there?—No.

592. Have you always enjoyed good health on this island?—Always, until I had the late attack of fever.

Antonio Maria Simoa, dark mulatto, native of Boã Vista, aged 25, examined.

593. How, and how long were you employed on board the "Eclair?"—Eight days. I was hoisting provisions out of the hold, restowing the hold, and hoisting in coals and water.

594. Were you on board the day on which the vessel sailed?—Yes, I helped to hoist the cots in.

595. Were you taken ill with the fever?—Yes; but not until the beginning of December. I live in the same house with Eusebio Vicente, and was ill when he was.

596. Did you see many sick before you were taken ill?—Yes, before I was taken ill I went to Cabeçada (Rabil) to see Luis Fortes Pathi; I also saw Joana Aneceto who was sick, and whose mother soon afterwards took ill and died of black vomit.

597. Have you ever been away from the island?—Yes, I have been on the coast of Africa in a slave-ship, whence we went to Brazil with 600 slaves,' and being chased by an English man-of-war, ran the ship on shore on the coast of Brazil. I have also been at St. Jago.

598. Have you ever had fever at St. Jago?—Yes, six years since at Porto Praya.

599. Have you in general enjoyed good health?—Yes, with the exception I have mentioned.

Gregorio Tavares, negro (slave), native of west coast of Africa, aged 25, examined.

600. Were you on board the "Eclair?"—Yes.

601. How long were you on board?—I went on board soon after the vessel came in to Boã Vista, and was employed either on board or in one of the launches until the vessel sailed.

602. Did you go on board the day the vessel came in?—Yes, I put several bags of foul linen into a boat, and came on shore from the ship, along with John Jamieson, the Consul's storekeeper.

603. Were you at all in the hold of the "Eclair?"—No, I was chiefly in the launches. I am patrao of Mr. George Rendall's launch.

604. Were you at all at the Fort while the sick of the "Eclair" were there?—No; but my duties led me to the island every day.

605. Have you had fever?—Yes.

606. When were you taken ill?—I do not know; but I believe I was the first person taken ill at Estacia.

607. Then you were taken ill at Estacia, and not at Porto Sal Rey?—Yes; at my master's house at Estacia.

608. How long were you sick?—Nearly a month.

609. Did many people visit you during your sickness?—A great many; no doctor.

610. Who was the next person taken ill at Estacia?—João Maria Berba.

611. Did he come to see you when you were sick?—Yes, he did.

Joaquim das Neves, negro, native of San Antonio, aged 50, examined.

612. Were you employed on board the "Eclair?—Yes, I was employed on board for six days.

613. How were you employed?—Hoisting in coals, and on the lower deck pumping water.

614. Were you ever at the Fort?—No.

615. Where do you live?—In Pao de Varella.

616. Did you go home every night?—Yes.

617. What family have you?—There are ten in the house altogether: my wife, children, nephews, and nieces.

618. Have any of you had fever?—Yes, all of us.

619. Who was first taken ill?—My wife's mother.

620. When was she taken ill?—Two days after Manoel Affonso died.

621. Had she been to see Affonso?—Yes; she had also visited Anna Gallinha during her illness.

622. Who was the next person in your house taken ill?—Myself.

623. Had you seen any sick people before you were taken ill?—Yes,

I saw Manoel Affonso, José Carlos Lisboa a European who lived in the next room to Anna Gallinha and Anterno Perica.

624. How long were you ill?—About a fortnight.

625. Did the rest of your family recover?—Yes, all of them.

626. I understand you were a good deal employed burying the bodies of those who died of the fever; was it so?—Yes, I buried the bodies of a great many; I should say nearly a hundred.

627. Who assisted you?—Francisco Gaspar, Domingos San Antonio, and Antonio Tomatao.

628. Were you not also assisted by two Spaniards?—The Spaniards used to roll some of the bodies up in sheets.

629. Where were the bodies buried?—Chiefly in the sand on the beach, some at the burial-place at Rabil, and the rest at the burial-place behind Pao de Varella.

630. What depth did you dig the graves on the beach?—About five or six feet deep.

631. Can you tell me who first died in Porto Sal Rey?—Yes, it was Anna Gallinha.

632. And after Anna Gallinha?—Manoel Affonso, Maria Nazarinha, José Carlos de Lisboa, Gertrude Bent, Antonio Perica, Eusebio da Luz, and a man called Domingos, a sailor.

Joao Joaquim Perez, dark mulatto, native of San Antonio, aged 23, examined.

633. How long have you been in this island?—Three years.

634. How long were you employed on board the "Eclair?"—Five days.

635. How were you employed?—Hoisting in coals and water.

636. Have you a family?—No; I live in a house by myself in Pao de Varella.

637. Have you had an attack of the late fever?—Yes, but I was not attacked until January last.

638. Had you been to see any sick people?—Yes, I had been visiting several relations who were sick.

639. How long were you ill?—Ten days.

640. Has your general health been good in this island?—Yes, always, until I had the fever.

Labourers who were employed on board the "Eclair" from the town of Rabil.

CABECADA.

Names.	Country.	Age.	How long on board.	If attacked with Fever, and when.	Result.
Luis Fortes Pathi	Native mulatto	40	8 days	Sept. 17, 1845	Recovered
Thomé Domingos	Do.	48	8 „	Dec. 1845	Do.
José Angela	Do.	49	2 „	Doubtful; but fever was common at Cabeçada	Do.
José Palinha	Do.	26	8 „	Do.	Do.
Antonio Angela	Do.	38	8 „	Do.	Do.
Joaquim Pathi	Do.	37	4 „	Do.	Do.
João Luis Evangelista	Do.	27	8 „	Jan. 1846	Do.
Sebastiano Fernandez	Negro native	24	6 „	When fever was raging	Do.
Manoel Domingos	Mulatto native	20	6 „	Do.	Do.
Theophilo Gomez	Do.	55	8 „	Not attacked	
Carlo da Rocha	Do.	40	8 „	When fever was common at Cabeçada	Do.
Luis da Moráes	Do.	22	4 „	Do.	Do.
Manoel Antonio da Luz	Negro native	53	4 „	Do.	Do.
Simplicio da Luz	Do.	20	3 „	Nov. 1845	Do.
Antonio Maria da Cruz	Mulatto native	31	1 „	Doubtful	Do.
Manoel Antonio da Silva	Do.	40	3 „	Oct. 1845	Do.
Feliciano Domingos					
Antonio Luis Fortes					
Manoel Felipa					
Bartholo da Luz	.. ..	..	..	.. .. ..	Died

Rabil Labourers on board the "Eclair."

BOAVENTURA.

Names.	Country.	Age.	How long on board.	If attacked with Fever, and when.	Result.
Dionysio da Cruz ..	Native negro ..	24	8 days	When fever was general in Rabil	Recovered
Serafin da Rocha ..	Dark mulatto native	30	8 "	Do.	Do.
Luis Santos Nazario ..	Mulatto native ..	25	3 "	End of September	Do.
Antonio da Cruz.. ..	Native negro ..	19	5 "	Nov. 1	Do.
Egidio da Britho ..	Do.	..	4 "	Not attacked	Do.
Silvestion Lucio de Moraes	Do.	25	3 "	When fever was general in Rabil	Do.
João Neça .. .	Dark mulatto native	30	8 "	Do.	Do.
Antonio José da Cruz ..	Mulatto native ..	20	5 "	Do.	Do.
João Ascensão	African negro ..	36	5 "	Do.	Do.
Antonio Barnabé ..	Dark mulatto native	20	3 "	Feb. 1846	Do.

Men from Rabil who were employed on board the "Eclair" at Boã Vista.

Luis Fortes Pathi, a dark mulatto, native of Boã Vista, aged 40, examined. (Cabeçada.)

641. Were you employed on board of the "Eclair?"—Yes, I was.

642. How long were you employed on board of her?—About eight days.

643. How were you employed?—Hoisting in water and coals.

644. Did you go below?—Yes, I was on the lower deck for nearly a day, pumping water.

645. Where were the sick at this time?—They were in the Fort on the small island. I was on board when they were brought from the island, the day the ship sailed.

646. Were you ever at the Fort?—No, not while the sick were there, nor since.

647. Did you return from the ship every night during the time you were employed?—Yes, I went to my house at Rabil every night.

648. Did you at once go to Rabil when the "Eclair" sailed from Boã Vista?—Yes, the very day she sailed.

649. Did you not take some small article of clothing, which you got on board "Eclair," with you to Rabil?—No, I took nothing but what I had on my back.

650. What family have you?—I have none left.

651. What family had you then?—I had a wife and three children.

652. Did they all die of fever?—Yes, all of them.

653. Were you attacked with fever?—Yes, I was first attacked.

654. When were you attacked?—About three days after I went to Rabil from the ship.

655. Are you quite sure you were taken ill so soon as three days after the ship sailed?—Yes, I am quite sure.

656. You were with your family when you were taken ill?—No, I

was not. I went to my own house when I first returned from the ship; but next day paid a visit to a friend of mine at Moradinha, a small village about half a mile to the south-east of Rabil, where a *festa* was being held, and was there taken ill.

657. How long did you remain at Moradinha?—I was there eight days, sick.

658. What did you complain of?—I had general fever, headache, pain of back and limbs—very sick.

659. Did you then return to your house in Rabil?—Yes, at the end of eight days I was carried to my house in Cabeçada (Rabil).

660. How long were you sick after your return to your own house?—Nearly three weeks.

661. Were you seen by any medical man?—No.

662. Did any one take sick in the house where you lay ill at Moradinha?—No, not until a long time afterwards.

663. Who, after yourself, was the first taken ill in your own family?—My daughter, 12 years of age.

664. How long after your return from the "Eclair," or, if you can recollect better, after your return from Moradinha, was it that this girl was taken ill?—She was taken ill some time about the beginning of October.

665. How long was she ill?—Only three days.

666. What symptoms had she?—She had burning fever, and for several hours before she died, vomiting of black stuff and delirium.

667. Was she seen by any doctor?—No.

668. Which of the family was next attacked?—Another girl, about seven years of age, about four days after the first one died. She only lived four days and died in the same way as her sister.

669. Who was the next?—My boy, about eleven years of age; he was taken ill within eight days after the second girl died, and lived only five days after he was seized.

670. And your wife next, and last?—Yes, my wife was taken ill on very same day as the last of the children died; she lived fifteen days afterwards, and died with black vomit. She was not visited by any medical man; but she took some medicine which was sent her by Dr. Almeida.

671. Were you the first person ill with fever in Cabeçada (Rabil)?—Yes, I am quite sure I was.

Thomá Domingos, a mulatto, native of Boã Vista, aged 48, examined.
(Cabeçada.)

672. What is your usual employment?—I am patraó, or coxswain, of one of Mr. George Rendall's launches.

673. Were you on board the "Eclair" when she was here?—Yes, I was.

674. How long?—I was eight days employed on board.

675. How were you employed on board?—Hoisting in water and coals.

676. Did you go below?—Yes, I was in the hold, moving the tanks, had assisted to whitewash the hold.

677. Were you at the Fort or anywhere on the island while the crew of the "Eclair" were there?—No.

678. Did you return to your house in Rabil every night?—Yes.

679. Were you employed on board until the "Eclair" sailed from Boã Vista?—Yes, to the last day.

680. Did you return to Cabeçada (Rabil) immediately after the "Eclair" left Boã Vista?—Yes, at once.

681. Have you had fever since that time?—Yes.

682. When were you taken ill?—Myself and children were taken with fever in November last. I lost two children from fever, but at the time we were attacked, the fever was general in Cabeçada (Rabil).

683. Who, to the best of your knowledge, was the first person that had the fever in Rabil?—I think it was Luis Pathi.

684. Who was the next?—I am not sure, but I think Joaquim Marques was the next; about this time several were taken ill; Manoel Rosa and José Marques were among the number.

685. Have you in general enjoyed good health in this island?—Always, until I had the fever.

José Angela, a mulatto, native of Boã Vista, aged 48 years, examined. (Cabeçada.)

686. You were, I believe, employed on board the "Eclair?"—Yes, I was.

687. How were you employed?—Hoisting in water and coals.

688. Did you go below?—No.

689. How was it you did not go below?—Because the people said there was fever in the ship below.

690. How long were you on board?—Only two days.

691. Were you discharged then?—No, I was sent to the watering-place to fill the casks, and swim off to the launch with them.

692. Did you at any time return to the "Eclair?"—No.

693. Were you at the Fort while the sick were there?—I was not at the Fort, but I was sometimes at the coal-heap on the small island.

694. Did you go to Cabeçada when the "Eclair" left Boã Vista?—Yes, at once.

695. Have you a family?—Yes, I have a wife and four children. My mother also resided with us.

696. Were you taken ill with fever?—Yes, but not until a great many were laid up in Cabeçada.

697. Had you been to see any sick in Cabeçada?—Yes, several; among them Luis Pathi and Manoel Rosa.

698. Who was the first person taken with fever at Cabeçada?—Luis Pathi.

699. How long were you ill?—About a week.

700. Did any medical man see you?—No.

701. Was any of your family taken ill?—Yes, my wife, children, and my mother.

702. How long after you were ill was it that your family were attacked?—My wife was attacked three days after I was, then my children in succession, and lastly my mother.

703. Did any of your family die?—Yes, my mother.

704. How long was she ill?—Only three days.

705. Had she been to see any sick besides those of your own family?—No, she was an old woman, and never went out of the house.

706. Have you in general had good health?—Yes, always, until I had fever.

707. Can you tell me how long it was after the "Eclair" sailed, that Luis Pathi was taken sick?—I cannot tell the time, but it was during a festa.

José Palinha, a mulatto, native of Boã Vista, aged 26, examined. (Cabeçada.)

708. How long were you employed on board the "Eclair?"—Eight days.

709. How were you employed during that time?—Hoisting in water and coals, and in stowing provisions.

710. Then you were in the hold?—Yes, I was.

711. Were you on board the day the "Eclair" left Boã Vista?—Yes, I assisted in heaving the anchor up.

712. Where did you go to when the "Eclair" sailed?—To my house in Rabil, the first day, and in two days we returned to Porto Sal Rey, to get my pay for working on board the "Eclair."

713. Did you then return to Rabil?—Yes.

714. Have you a family?—Yes, a wife and three children.

715. Were you or any of your family taken ill with fever?—I was not, but my wife and children all were attacked.

716. When were they attacked?—Not until November, when many had fever in Cabeçada.

717. Did your wife go to see people who were sick.—Yes, she nursed several sick people.

718. Did your wife and children all recover?

719. Have you in general had good health?—Always.

720. Who, do you think, was first taken ill at Cabeçada?—Luis Fortes Pathi.

Antonio Angela, a dark mulatto, native of Boã Vista, aged 35, examined. (Cabeçada.)

721. You were, I believe, a labourer on board the "Eclair?"—Yes, I was.

722. How long?—Eight days.

723. How were you employed on board?—Moving the tanks about, hoisting in coals and water, and doing anything I was told.

724. Were you at the Fort during the time the sick were there, or at any time afterwards?—I was not near the place while the sick were there; but after they left I went with John Jamieson to put the coal-heap on the island to rights.

725. Did the sick return from the Fort to the vessel before you left her?—Yes, I helped to get them on board.

726. Did you go to Cabeçada when the vessel sailed?—Yes, I went to my mother's house there.

727. Were there others besides yourself and mother then residing in the house?—Yes, Theophilo Gomez.

728. Have you had fever since the "Eclair" left?—Yes, I have.

729. When had you fever?—I do not know dates, but it was some time after Luis Pathi and Manoel Rosa were ill.

730. Was your mother attacked?—Yes, she was attacked about three days after I was.

731. Did you go and see many sick people?—Yes.

732. Did your mother visit sick people?—No.

733. Was Theophilo Gomez taken ill?—No, he went to Estacia.

734. Did your mother recover?—Yes.

735. How long was she ill?—About a month.

736. Have you ever been at St. Jago?—Yes.

737. Had you fever while there?—Yes.

738. How long were you ill at St. Jago?—Nearly a month.

739. How long is it since you were there?—Twelve months.

740. Have you in general enjoyed good health on this island?—Always, until the steamer came here.

Joaquim Pathi, a mulatto, native of Boã Vista, aged 37, examined. (Cabeçada.)

741. Are you related to Luis Pathi?—Yes, he is my cousin.

742. Were you employed on board the "Eclair?"—Yes, I was four days on board.

743. Were you employed on board during the last four days the vessel was here?—Yes, I assisted to weigh the anchor.

744. Did you assist in getting the sick on board?—Yes, I assisted in getting them out of the boats.

745. Did you go to Rabil after the vessel sailed?—Yes, immediately the vessel sailed.

746. What family have you?—A wife and three children.

747. Were you attacked with fever?—Yes.

748. When were you attacked?—I am not sure of the time, but I know it was after my cousin Luis Pathi was sick.

749. Had you been to see your cousin when he was ill?—Yes, I went to see him when he was ill at Moradinha.

750. How long after you saw your cousin at Moradinha was it that you were taken sick?—It was not for some days; for my cousin was brought to Cabeçada, where I again saw him before I was laid up.

751. Do you know who were among the first taken ill with fever at Cabeçada?—Yes; my cousin Luis Pathi and his children first, then Manoel Fachina, then Manoel Rosa, then Luis Delgado Nazario, and next Joaquim Pacho or Marques.

752. Had Manoel Fachina ever been on board the "Eclair" or at the Fort?—I cannot say.

753. Was Manoel Rosa on board or at the Fort?—Yes, he belonged to one of the launches, and was on board the "Eclair," and at the Island where the Fort is.

754. Was Luis Nazario ever on board the "Eclair" or at the island?—No.

755. Where does Luis Nazario live?—He lives next door to me.

756. Had he been to see your cousin Luis or yourself?—He came and saw me when I was ill; I do not know whether he saw my cousin.

757. How long were you ill?—Eight or nine days.

758. How long was your wife ill?—Only five or six days.

759. And the children?—They had only slight attacks of a few days.

760. Your wife and children all recovered?—Yes, all of them.

761. Have you ever been to any of the other islands?—Yes, to Sal and San Nicolao.

762. Were you sick at either of these islands?—No.

763. Have you in general enjoyed good health?—I never had a headache until I was attacked with the late fever.

Luis Delgado Nazario, mulatto, native, aged 43, examined. This man was not employed on board the "Eclair," but he is examined here on part of Joaquim Pathi's evidence.

764. You were not on board the "Eclair" during her late visit to this island; nor at the Fort, when her sick crew were there?—No, I was at neither.

765. Had you fever during the time that vessel was here, or at any time afterwards?—Yes, I had fever after she sailed from this island.

766. Where were you when you were laid up?—At Rabil.

767. Had you visited any sick people at Rabil or anywhere else?—Yes, I visited Joaquim Pathi, who is my next-door neighbour, when he was sick; also Joaquim Marques, who lives close to me; he and his sons had fever when I saw them. I likewise saw Manoel Rosa when he had fever.

768. Did you not go occasionally to Porto Sal Rey?—Yes, I went there sometimes, but not into any sick houses.

769. What family have you?—A wife and two children.

770. Were they taken ill?—Yes, after me.

771. Were they a long time unwell?—They were not more than four or five days sick.

772. They all recovered?—Yes.

773. Have you ever been at St. Jago, or any of the other islands?—I have been at Sal, San Nicolao, and San Antonio, but never at San Jago.

774. Have you in general had good health?—Yes.

João Luis Evangelista, negro, native of Boã Vista, aged 27, examined. (Cabeçada.)

775. How long were you employed on board the "Eclair?"—Eight days.

776. How were you employed?—Hoisting in coals and water, and pumping water on the lower deck.

777. Were you in the hold?—No.

778. Were you at the Fort on the small island?—I was on the island, but not at the Fort.

779. Were you on board when the sick came from the Fort?—Yes, I was.

780. Have you had fever?—Yes.

781. When were you attacked?—Not until the latter end of the sickness on the island.

782. What family have you?—I have a wife—no children.

783. Was your wife attacked?—Yes, she was taken ill before I was.

784. Had she been among sick people?—Yes, she had been with her father, Marques Antonio Lopez, when he had the fever.

785. Was your father-in-law ever on board the "Eclair?"—Yes, he went on board to get water-casks.

786. Was he at the Fort.—No.

787. Had he been visiting others who were sick?—Yes, a great many.

788. Did he recover?

789. Did your wife recover?—Yes, she was ill about sixteen days.

Dionysio da Cruz, negro, native of Boã Vista, aged 25, examined. (Boaventura.)

790. How long were you on board the "Eclair?"—One day only on board; and seven days at the coal-heap on the island.

791. On what day were you on board?—It was several days before she sailed.

792. Did you go below?—No.

793. Have you had fever since the "Eclair" was here?—Yes, I had an attack about two months since, and a relapse a short time back.

794. Were you visiting sick people before you had fever?—Yes, I visited the father of Mrs. Pettingal's servant Rosa.

Sebastiano Fernandez, negro, native of Boã Vista, aged 24, examined. (Cabeçada.)

795. You were, I believe, a labourer on board the "Eclair?"—Yes, I was six days employed on board of her.

796. You always came on shore in the evening?—Yes, I always went to Rabil in the evening.

797. How were you employed?—Hoisting in coals and water.

798. Were you at the Fort?—No.

799. Were you on board the day the ship sailed?—Yes.

800. Have you had the fever which has been prevailing here?—Yes.

801. When were you attacked?—Not until the fever was raging in Cabeçada.

802. Have you a family?—A wife and four children.

803. Had you been among sick people?—Yes, I saw Joaquim Pathi's mother sick.

804. Were your wife and children taken ill?—Yes, all of them.

805. Did they recover?—Yes.

806. Have you ever been away from the island?—Not since I was a child, when I was at Brava.

807. Have you ever had any illness before the late attack of fever?—Never.

Manoel Domingos, mulatto, native of Boã Vista, aged 20, examined.
(Cabeçada.)

808. How long were you on board the "Eclair?"—Six days.

809. Were you at all below?—Yes, I was in the hold getting provisions up and restowing them; I was also employed hoisting in coals and water.

810. Were you on board the day the ship sailed?—Yes.

811. Were you at the Fort the day the sick were there?—No.

812. Have you had an attack of the late fever?—Yes; but the fever was general in Porto Sal Rey and Rabil before I was attacked.

813. Did you go to see sick people?—Yes, I went to see Luis Pathi, Joaquim Marques, and some others in Cabeçada.

814. How long were you ill?—Only four or five days.

815. With whom do you live?—With my father and step-mother.

816. Were you the first person taken ill in the house?—No, my father was.

817. Had your father visited any sick person before he was taken ill?—Yes, he had been to see Luis Pathi and many others.

818. How long was your father ill?—He died on the fifth day.

819. Had he ever been on board the "Eclair" or at the Fort?

820. Was your step-mother taken ill?—Yes, after my father.

821. How long was she ill?—She was ill six days and died.

822. Had she visited many sick persons?—I do not know.

823. Have you ever been away from this island?—No, never.

824. Have you ever had fever or any illness before you had the late attack?—No, not since I was a child.

Theophilo Gomez, native of Boã Vista, a mulatto, aged 35, examined.
(Cabeçada.)

825. How long were you employed on board the "Eclair?"—Eight days.

826. How were you employed on board?—Hoisting in coals and water, and in the hold moving tanks about.

827. Were you at the Fort while the sick were there?—No.

828. Were you on board the day the vessel sailed?—Yes.

829. Did you return to Rabil every night, and when the vessel sailed?—Yes, I did.

830. What family have you?—A wife only.

831. Have you had fever?—No; but I am continually troubled with pains in my limbs.

832. Has your wife been attacked?—Yes, but very slightly.

833. Did you remain at Cabeçada during the time of the sickness?—No; when the fever broke out we went to Estacia.

834. Was your wife taken ill at Estacia?—Yes.

835. Then was there fever in Estacia before she was taken ill?—Gregorio Tavares and Simond da Cruz were both ill before she was. I do not know any others that were sick before her in Estacia.

836. Did you attend her in her illness?—Yes.

837. Who else besides yourself saw her in her illness?—The wife of a man called Joaquim Lalli: at this time a man called Justinian da Silva Britho came from Porto Sal Rey; he fell sick at once and died.

838. Did the wife of Joaquim Lalli recover?—Yes.

839. Have you ever been away from the island?—No.

Carlo da Rocha, mulatto, native of Boã Vista, aged 40, examined.
(Cabeçada.)

840. You were a labourer on board the "Eclair?"—Yes, I was eight days on board.

841. How were you employed on board?—In getting in coals and water and in storing provisions in the hold.

842. Were you on board the day the "Eclair" sailed?—Yes, I was.

843. Were you at the Fort while the sick were there?—No, but I was on the island during one day, working at the coal-heap.

844. Did you return to Rabil when the "Eclair" sailed from Boã Vista?—Yes.

845. What family have you?—A wife only.

846. Were you attacked with fever?—Yes.

847. When were you attacked?—I do not know the time; but Joaquim Marques, Joaquim Pathi, and Manoel Rosa, were all sick before I was.

848. Did you visit them when they were sick?—Yes, I did.

849. Was your wife sick?—Yes, she got fever after attending upon me a short time.

850. Had she been to see many who were sick?—No, no one but myself.

851. Did your wife recover?—Yes.

852. Is your house near to that of Luis Pathi?—Yes, quite close to it.

853. Have you in general enjoyed good health?—Yes, always until I had the fever.

854. Have you ever been away from the island?—Yes, fifteen years ago I was a short time at San Antonio.

Luis da Moraes, dark mulatto, native of Boã Vista, aged 22, examined. (Cabeçada.)

855. How long were you on board of the "Eclair?"—Four days.

856. How were you employed during that time?—Hoisting in coals and water.

857. Did you go below?—Not below the lower deck.

858. Were you at the Fort?—No.

859. Were you on board when the ship was weighing anchor?—Yes, I was.

860. Have you had the fever?—Yes, I have had fever twice.

861. When were you first taken ill?—I do not know; but fever was common in Cabeçada when I was taken ill.

862. Who do you live with?—With my master, Antonio Nazario.

863. Was your master sick?—Yes, he was sick before I was.

864. Had your master been much among sick people before he was taken ill?—Yes, he had seen a great many in Porto Sal Rey, as well as in Cabeçada.

865. How long were you ill?—Four days.

866. Had you been to see many sick?—No, only my master.

867. Have you ever been off the island?—No.

868. Have you in general had good health?—Yes.

Manoel Antonio da Luz, negro, native of Boã Vista, aged 53, examined. (Cabeçada.)

869. You were employed on board the "Eclair?"—Yes, I was four days on board when she first came in.

870. How were you employed?—Hoisting in water.

871. Were you below?—I was some time on the lower deck pumping, and in the engine-room.

872. Did you return to Cabeçada every night?—Yes, I did.

873. Were you also employed in the launches?—Yes, I was five days employed in one of the launches.

874. How many are there in your family?—Nine in all.

875. Have you had the fever?—Yes, I had fever some time early in November.

876. Who were sick before you were, in Cabeçada?—Joaquim Marques, Luis Pathi, and some others.

877. Who was first attacked in your house?—My son, a boy of fifteen.

878. Had this boy been among sick people?—Yes, he had been with his brother, a soldier in the barracks, who was sick.

879. Who was next taken ill in your house?—Myself.

880. How long was the boy ill?—Four days.

881. How long were you ill?—Nearly a month.

882. Were the others of the family sick at the same time?—Yes, the fever ran through the whole of them.

883. Had you been much among sick people?—Yes, I had been with Luis Pathi and Joaquim Marques.

884. Did all your family recover?—Yes, all of us.

885. Have you ever been away from the island?—Yes, I have been at San Jago and Sal.

886. Have you in general enjoyed good health?—Yes.

Simplicio da Luz, negro, native of Boã Vista, aged 20, examined. (Cabeçada.)

887. How long have you been a soldier?—I became a soldier just after the "Eclair" left this island.

888. Were you employed on board the "Eclair?"—Yes, I was.

889. How long were you employed on board?—Three days. I was five days at the watering-place.

890. Were you at all below, when on board the "Eclair?"—Yes, I was working one day on the lower deck.

891. Were you at the Fort while the sick was there?—No.

892. Were you attacked with fever?—Yes, I was attacked after I became a soldier; I was then in the barracks where there were several sick.

893. How long were you ill?—Only a few days.

894. Were you visited by your friends?—Yes, by my brother, who afterwards took sick.

895. Did your father also visit you?—Yes, he did.

896. Have you ever been away from the island?—No.

897. Have you in general had good health?—Yes.

Antonio Maria da Cruz, dark mulatto, native of Boã Vista, aged 31, examined. (Cabeçada.)

898. How long were you employed on board the "Eclair?"—Only one day, watering.

899. Were you in any other way employed for that ship?—Yes, I was five days at the coal-heap on the island.

900. Did you go to the Fort while the sick were there?—I used sometimes to go to the tent where the water was kept, but not among the sick people.

901. Were you on board the ship?—Yes, I was on board the day the vessel sailed, and assisted in getting the anchor up.

902. Did you go to Rabil every night while you were employed in the ship and on the island?—Yes, with the exception of the night on which she sailed, when I slept at the house of Antonio Perica, in Porto Sal Rey.

903. You live in Cabeçada?—Yes.

904. Have you had the fever?—Yes.

905. When had you fever?—I do not know the time; but there were

several sick before me, Luis Fortes Pathi, Joaquim Marques, Joaquim Pathi, and others.

906. Had you been to see any of them?—Yes, I was in the habit of taking soup to my cousin, Joaquim Marques, when he was sick.

907. Who was the first person you knew of as being sick at Cabeçada?—Luis Fortes Pathi.

908. Do you know if he was taken ill at Cabeçada?—He was ill at Moradinha, when at a dance there; he was removed to Cabeçada, and recovered; but his wife and three children died of fever.

909. Were you not in the habit of visiting Porto Sal Rey before you were taken ill?—Yes, I went to see Manoel Affonso and Antonio Perica, who is my cousin.

910. Was Luis Pathi sick before Manoel Affonso was?—Yes, long before.

911. Did your wife visit Antonio Perica and Manoel Affonso?—Yes, she did.

912. What family have you?—A wife and one child; a little boy from San Antonio was also living with us at this time.

913. Who was first attacked with fever in your house?—My wife.

914. Had she seen many sick?—Yes.

915. Who was next attacked?—My son, a boy twelve years of age.

916. And next?—Myself.

917. How long was your wife ill?—Four days; she had very high fever, getting stronger (the fever) every night; she recovered.

918. How long was the boy ill?—Three days; the first and second days high fever, and then constant black vomiting until he died.

919. Did any medical man see him?—Only one of our country doctors.

920. What did the boy from San Antonio complain of?—Fever with vomiting; but he had no black vomit.

921. How long was he ill?—Eight days.

922. How long were you ill?—I was about a week confined to bed.

923. Who came to see you during your illness?—Only a few; Christophe Pinheiro and some others; they all had fever afterwards.

924. Have you ever been away from this island?—Yes, I have been at all the Cape de Verds except Brava.

925. Have you ever had fever before your late attack?—No.

926. Have you in general enjoyed good health?—Yes.

Manoel Antonio da Silva, native of Boã Vista, aged 40, examined.
(Cabeçada.)

927. How long were you on board the "Eclair?"—Three days.

928. Did you go below?—Yes, I was sometimes on the lower deck.

929. Were you employed also in the launches?—Yes, for three days.

930. Were you on board when she sailed?—Yes.

931. Have you had fever?—Yes.

932. When had you the fever?—Some short time after Joaquim Marques; I think it was about the end of October.

933. How many are there in your house?—My wife and five children.

934. Had you been to see sick people?—Yes, I had seen a child of Luis Pathi and a child of Fachina, who were both sick, and died.

935. Who was first taken ill in your house?—Myself.

936. Who next?—In two days more the whole of my family were attacked.

937. Were they long ill?—They were ill from three to five days with high fever.

938. They all recovered?—Yes.

939. Have you ever been off this island?—Yes, I have been to the coast of Africa three years ago, and had then a slight fever.

940. Has your health, in general, been good?—Yes.

Serafin da Rocha, dark mulatto, native of Boã Vista, aged 30, examined.
(Boaventura.)

941. Were you employed on board the "Eclair?"—Yes, eight days.

942. Were you below?—Yes, I was working on the lower deck two days.

943. Were you quite well all the time you were on board?—Yes.

944. Did you return to Rabil when the "Eclair" sailed?—Yes.

945. Have you a family?—No, I am a single man. I live with my mother and sister.

946. Have you had fever?—Yes, but not until the sickness was nearly over.

947. Had you been visiting many sick people?—No, I kept out of their way as much as I could. I was only ill a few days.

948. Was your mother or your sister sick?—My mother was slightly after I was.

Luis Santos Nazario, dark mulatto, native of Boã Vista, aged 25, examined.
(Boaventura.)

949. Were you employed on board "Eclair?"—Yes.

950. How were you employed?—In coaling, and in whitewashing the hold.

951. How long were you in the hold?—One day only.

952. How long were you employed altogether?—Three days on board, and two days at the watering-place swimming off to the launches with casks.

953. Did you go to Rabil when the "Eclair" left this island?—Yes.

954. Have you had fever?—Yes.

955. Who do you live with?—My father and mother.

956. When were you attacked?—Four or five days after Luis Pathi was.

957. How long were you ill?—Only three days.

Antonio da Cruz, negro, native of Boã Vista, aged 19, examined.
(Boaventura.)

958. How long were you employed on board the "Eclair?"—Five days.

959. How were you employed?—Taking coals and water.

960. Were you below?—Yes, I was in the engine-room.

961. Were you in the hold?—No.

962. Were the sick on shore while you were employed on board?—They came on board from the Fort the last day the vessel was here.

963. Did you return to Rabil when the vessel sailed?—Yes, to the house of my father and mother.

964. How many are there in the house?—Four brothers and sisters in addition to myself, father, and mother.

965. When were you attacked with fever?—I think it was about the beginning of November.

966. How many were sick in Boaventura before you were?—I am sure I was among the first taken sick at Boaventura; but there were some sick there before me. M. Antonia da Graça Pinto; Rosa Fortes, servant of Mr. Pettingal; Rosa's father and mother, were all sick when I was taken ill.

967. When was Mr. Pinto taken ill?—I am not sure; he was taken ill at Porto Sal Rey, and brought to Boaventura: I rather think he was the first person who had fever there.

968. How long were you laid up?—Eight days.

969. Did any medical man see you?—No.

970. Were the others of your family taken ill?—Yes.

971. Before or after you?—About three weeks after me my brother Luiz was attacked.

972. Did any of your family die?—Yes, my sister, nineteen years of age.

973. When was she taken ill?—I was the first attacked, then Luiz my brother, then my mother, then my sister who died, and last Dionysio.

974. How long was your sister ill?—Seven days.

975. What did she complain of?—She talked foolishly; and some time before her death had black vomit.

976. Did you visit many sick people before you were taken ill?—No; but I was ordered by the mayor to carry dead bodies from Porto Sal Rey to Rabil.

977. How long after you did this was it that you were attacked with fever?—About a week.

978. Have you in general enjoyed good health?—Yes, always, until lately.

Egidio da Britho, dark mulatto, native of Boã Vista, aged 38, examined. (Boaventura.)

979. You were on board the "Eclair?"—Yes.

980. How long were you on board?—Four days.

981. Were you on board during the early or latter part of her stay here?—I was on board the day on which she sailed from this place.

982. You returned to Rabil when the "Eclair" sailed?—Yes, the same day.

983. Have you a family?—Yes, I have a wife and two children.

984. Have you had fever?—No.

985. And you were in Rabil during the time the sickness was prevailing?—No; when the sickness began, I removed with my family to the east side of the island, where there are only three small houses.

986. When did you return?—Not until March last.

987. Did any of your family take sick?—Yes, a child of mine, three years of age, took sick five days after we returned.

988. Had this child been among sick people?—Yes, she had been to see her grandmother who was laid up with fever.

990. Did the child recover?—Yes.

991. Have you ever been away from this island?—No.

992. Have you in general enjoyed good health?—Yes.

Silvestion Lucio de Moraes, negro, native of Boã Vista, aged 25, examined. (Boaventura.)

993. How long were you employed on board the "Eclair?"—Three days.

994. How were you employed?—Hoisting in coals and water.

995. Were you at the Fort while the sick were there?—No.

996. Were you on board when the vessel sailed?—Yes, I was on board on that day.

997. Did you return to Rabil when the vessel sailed?—Yes.

998. Have you a family?—I have a wife and child.

999. Have you had the fever?—Yes, I have; but I was not taken ill until January last.

1000. Was your wife or your child taken sick?—Yes, both of them.

1001. Who in the house was first attacked?—First my wife, then myself, and the child last.

1002. Had your wife been among sick people?—Yes, a good deal.

1003. Did you all three recover?—Yes.

1004. Have you in general had good health?—Yes.

Joao Neça, dark mulatto, native of San Antonio, aged 30, examined.
(Boaventura.)

1005. How long have you been at Boã Vista?—Twenty years.

1006. What is your usual employment?—I am a labourer, working in boats at the salt-pans, or at anything I can get.

1007. How long were you employed on board the "Eclair?"—Eight or nine days.

1008. Were you employed below?—Yes.

1009. What were you doing below?—I was stowing coals.

1010. Were you at the Fort while the sick were there?—No.

1011. Did you return to Rabil when the "Eclair" sailed?—Yes, I did.

1012. Have you a family?—I have a wife; no children.

1013. Were you or your wife taken ill?—Yes, my wife was taken ill.

1014. When was she taken ill?—Not until the sickness was general in Boaventura.

1015. Do you know who was first taken ill at Boaventura?—I do not know.

Antonio José da Cruz, mulatto, native of Boã Vista, aged 20, examined.
(Boaventura.)

1016. How long were you employed on board the "Eclair?"—Five days.

1017. How were you employed during this time?—Hoisting in coals and water.

1018. Were you on board when the sick were brought from the Fort?—Yes, I was.

1019. Did you go below?—Yes, I was employed some time moving iron ballast in the hold.

1020. Have you been sick?—Yes.

1021. When were you taken sick?—I do not know.

1022. Who were sick in Boaventura before you were?—Antonio da Cruz, Dionysio da Cruz, Serafin da Rocha, and several others.

1023. Do you live with your father?—Yes, with my father and mother.

1024. Were they taken ill?—No.

1025. Were you in any of the houses where there were sick?—No.

1026. Was your father or mother?—I do not know.

1027. Did your mother nurse you?—Yes.

1028. How long were you sick?—Four or five days.

1029. Have you in general had good health on the island?—Yes.

João Ascensao, negro, native of coast of Africa, aged 36, examined.
(Boaventura.)

1030. How long were you employed on board the "Eclair?"—Five days.

1031. How were you employed?—Hoisting in coals and water.

1032. Have you had fever?—Yes, I had fever in Porto Sal Rey.

1033. Do you know about what time you had the fever?—No, I do not; but it was just after Nazarinha died. I rolled her up in her winding-sheet; I also did the same for Antonio Perica.

1034. How long were you ill?—Only three days.

1035. Where do you live?—In the house of Cecilia da Britho, my mistress.

1036. Was any one else taken ill in the house?—Yes, a little girl, who attended me during my illness.

1037. Have you been away from the island since you first came from Africa?—No, never.

1038. Have you in general enjoyed good health?—Yes.

Antonio Barnabé, dark mulatto, aged 20, native of Boã Vista, examined. (Boaventura.)

1039. How long were you employed on board the "Eclair?"—Three days.

1040. Did you ever go to the Fort?—No.

1041. Did you go below?—Yes, on the lower deck.

1042. Did you go to your home in Rabil every night?—Yes.

1043. Have you had fever?—Yes, I have only very lately recovered.

1044. How many are there in your house?—Now, only my father, five brothers and sisters, and myself. One of my brothers died.

1045. Have you all had fever?—Yes.

1046. Who was first attacked?—My brother Manoel, who died.

1047. When was he taken ill?—Not until the 7th of February.

1048. Had he been at all among people who had fever?—Yes; although we were all much afraid of fever, yet my brother saw Dr. Kenny when he was ill. People from sick houses were always coming to us; and we lived close to Rosa, Mrs. Pettingal's servant, when she had fever.

1049. How long was your brother Manoel ill?—Three days; he died with black vomit.

1050. How long were the others sick?—From four or five days to a week.

1051. Did all recover, except Manoel?—Yes.

1052. Were you and your family at Boaventura during the whole time of the sickness?—Yes.

1053. Did you all attend upon Manoel when he was sick?—All except my father, who went into the next house.

1054. Have you in general had good health?—Yes.

Labourers on board the "Eclair" from Estacia.

Names.	Country.	Age.	How long on board.	If attacked with Fever, and when.	Result.
Miguel Nane	Mulatto native	26	4 days	When Fever was general in Estacia.	Recovered.
Narcisso da Graça ..	Ditto ..	26	1 ditto	Ditto	Ditto

Narcisso da Graça, mulatto, native of Boã Vista, aged 26, examined.

1055. How long were you on board the "Eclair?"—Only one day.

1056. How were you employed during that day?—Hoisting in water.

1057. Where were the sick at the time you were on board?—They were at the Fort.

1058. Were you ever at the Fort while the sick were there?—No; but I was at the island six days while the sick were there.

1059. Were you taken ill with fever?—Yes, I was taken ill at Rabil.

1060. When were you taken ill?—Not until January, when the fever was common.

1061. How long did you remain at Rabil?—Until I was a little better; perhaps a week.

1062. Did your wife get fever?—Yes, she got fever two days after we arrived at Estacia.

1063. Did she recover?—Yes.

Miguel Nane, mulatto, native of Boã Vista, aged 26, examined. (Estacia.)

1064. You were a labourer on board the "Eclair?"—Yes, I was four days on board.

1065. How were you employed?—Hoisting in coals and water, and in storing provisions in the hold.

1066. Were you at the Fort among the sick?—No, I was on the island, but not at the Fort.

1067. Did you return to Porto Sal Rey every night?—Yes.

1068. When the ship sailed, did you remain at Porto Sal Rey, or did you go on to Estacia?—I went to Estacia the next day.

1069. Did you find any one sick at Estacia?—No one.

1070. Who was first taken sick at Estacia?—The first I knew of was João Chico Fernandez and Libania.

1071. Who was next taken ill?—I do not know.

1072. Were you taken sick?—Yes, some time in November.

1073. Were there many sick at this time?—Yes.

1074. How long were you ill?—Nearly three weeks altogether.

1075. Have you a family?—Yes, I have a wife and one child.

1076. Were they taken ill?—Yes; first my wife, after me, and then my child.

1077. Did they recover?—Yes.

1078. Had you and your wife been to sick people before you were attacked?—Yes.

1079. Do you know how long João Chico Fernandez and Libania were at Estacia before they were taken ill?—They came from Cabeçada (Rabil), sick.

1080. Have you ever been away from the island?—No.

1081. Have you always, until lately, had good health?—Yes.

ESTACIA.

Manoel Joaquim da Britho, dark mulatto, native of Boã Vista, aged 60, (stone mason,) examined.

1082. Where do you generally live?—In Estacia.

1083. Were you at Estacia when fever first appeared there after the departure of the "Eclair?"—Yes, I was.

1084. Who was first taken sick at Estacia?—I am not quite sure who was first sick, but my brother Justinian Silva da Britho was the first person that died there of fever.

1085. When did he die?—About the latter end of November.

1086. Did you go to see him?—Yes, as did also my brother, who was called Fortunato Antonio da Britho.

1087. Were you taken sick?—Yes, about five weeks after the death of Justinian.

1088. Had Justinian seen many sick people before he was taken ill?—Yes, he had just come from Porto Sal Rey, when the fever was raging, before he was taken ill at Estacia.

1089. Had he been on board "Eclair" or at the Fort?—No.

1090. How long was it after he came from Porto Sal Rey that he was taken ill?—Three days.

1091. How long was he ill?—He died on the fifth day.

1091a. Was Fortunato attacked?—Yes, he was.

1092. How long after Justinian's illness?—About eight days after, when he was removed from Estacia to Porto Sal Rey, and died.

1093. Had Fortunato seen any sick besides his brother?—Not that I am aware of.

1094. Do you think he was on board the "Eclair" or at the Fort, while the sick were there?

1095. Who attended Fortunato during his illness?—A boy called Francisco.

1096. Was this boy taken ill?—Yes, and he also died after four days' illness.

1097. Was any one else attacked in Fortunato's house?—Yes, a child of Fortunato's, which also died.

1098. (2nd Examination.) You lost a brother called Luis from fever?—Yes, he had been about ten days only from Porto Praya, and was taken ill and died at Estacia some time in December.

Senhor Nicolao Tavares, mulatto, farmer at Estacia or Povoçao Velha, native of Boã Vista, aged 60, examined.

1099. Were you here when fever broke out at Estacia?—I was at Estacia.

1100. Who was first sick at Estacia?—A son and daughter of Chico Fernandez; their names are Joao Chico Fernandez and Libania.

1101. Who was next taken ill?—Justinian was ill about the same time. He had just come from Porto Sal Rey. He was my nephew; he died on the 24th of November.

1102. What did he complain of?—Fever, pains of head, and all over his body; he had vomiting of blood before he died; and there was black blood all about his mouth after he died.

1103. Had Justinian been among sick people before he was taken ill?—I cannot say, for he came from Porto Sal Rey, and I am nearly always at Estacia.

1104. Did you visit Justinian?—Yes.

1105. Have you had fever?—No.

1106. Did any of the visitors have fever?—Yes; both of Justinian's brothers, Luis Vicente and Fortunato, were taken ill, and died.

1107. Had they been in Porto Sal Rey, or had they been anywhere else besides Estacia, when people had the fever?—Fortunato had been at Porto Sal Rey, and he was taken there, and he died there; but I am quite sure that Luis Vicente had not left Estacia for several days before he was taken ill.

1108. When did Luis Vicente die?—At Estacia, on December 13.

1109. How long was he ill?—Only a few days.

1110. At what period do you think the fever was at its worst at Estacia?—In November and December.

1111. Are you quite sure there was no one sick in Estacia before the arrival of the son and daughter of Chico Fernandez?—I am perfectly sure.

Libania Fernandez, negress, native of Boã Vista, aged 24, examined. (Estacia.)

1112. When and where were you attacked with fever?—My brother Joao Chico Fernandez and myself were at Rabil in November, where many were ill with fever. We left Rabil (Cabeçada) some time in the same month, and as we were then not very well, we were carried on donkeys. We went to Estacia, and were almost the same day laid up with fever.

1113. Had you seen many sick in Cabeçada?—Yes, several.

1114. Had you been in Porto Sal Rey?—No, not for months; at least I can speak for myself.

1115. Was there no one sick in Estacia, when you arrived there?—I have every reason to think that we were the first sick in Estacia.

1116. How many were there in the house?—My father, mother, and five children.

1117. Were you all attacked?—Yes, all except my little sister.

1118. Did you all recover?—Yes.

1119. Do you know any one else who was sick after you were?—Yes, the family of Simao Antonio da Cruz, who lived near to us. Six children died in that house.

PART III.

Contents.

Lists of men who were employed in the launches coaling and watering Her Majesty's ship "Eclair" when that vessel was at Boã Vista—

1. From Porto Sal Rey;
2. From Rabil—Cabeçada.

The evidence of the survivors is also given.

LIST of Men who were employed in the Launches while the "Eclair" was at Boã Vista.

From Porto Sal Rey.	Country.	Ages.	How long in launches.	If ever on board "Eclair," or at Fort.	If attacked with fever, and when.	Result.
Domingos Soares	Native mulatto	42	8 days	On board "Eclair"	1845 End of Nov.	Recovered
Lorenzo Gomes	Negro	30	2 do.	Do.	Dec.	Do.
Manoel Jezus	Mulatto	31	8 do.	Neither	Dec.	Do.
Manoel dos Santos Conceição.	Negro	25	6 do.	In Fort, but not among sick	Nov.	Do.
Pedro Ascensão	Do.	25	5 do.	On board "Eclair"	Not attacked	
Sopriano dos Santos	Do.	60	6 do.	Do.	Nov.	Do.
Felipe dos Santos	Do.	40	5 do.	At Fort; day sick; left it	Early in Dec.	Do.
Manoel Ambrosia	Do.	45	2 do.	Neither	End of Dec.	Do.
Rafael dos Santos	Do.	21	3 do.	Do.	Dec.	Do.
Verissimo da Rocha	Do.	30	8 do.	On board ship	End of Dec.	Do.
Manoel Antonio Ascensão.	Do.	32	2 do.	Neither	Do.	Do.
Vicente Ignacio	Do.	30	2 do.	On board "Eclair"	Not attacked	
Portajo	.. ..	..	..	.. ..	Nov.	Died

Domingos Soares, dark mulatto, (slave,) native of Boã Vista, aged 42, examined.

1120. Were you employed in the launches coaling and watering the "Eclair?"—Yes, I was eight days so employed.

1121. Did you go on board the "Eclair?"—Yes, I generally went on board when the launch was being discharged.

1122. Were you on board when the sick came on board?—Yes, I was.

1123. Have you had fever?—Yes, I was taken ill at Boaventura, some time towards the latter end of November.

1124. Had you been among sick people?—Yes, I had been a good deal with Mr. Pinto, brother-in-law to Mr. João Baptista. Mr. Pinto died.

1125. How long were you ill?—Two months nearly. I was a long time weak.

1126. Did any one else take sick in the house you lived in?—Yes, a boy who attended upon me was taken ill, and very nearly died.

1127. Did any others in the house take sick?—Yes, I live in Mr. Baptista's house, and all the family had fever after me.

1128. Have you ever been away from the island?—Yes, I have occasionally been at San Jago, San Nicolao, and Sal.

1129. Have you in general had good health?—Yes.

Lorenzo Gomes, negro, (slave,) native of Bissão, aged 30, examined.

1130. How long were you employed in the launches attending upon the "Eclair?"—Only during the last two days she was here.

1131. Were you ever on board the "Eclair" or at the Fort, while the sick were there?—I was on board the ship, but not nearer the Fort than the tent where the water was kept.

1132. Have you had fever?—Yes, I was taken ill in December last, after I had attended Portajo, another slave of Mr. Baptista's, who died of fever.

1133. Have you in general had good health?—Yes.

Manoel Jezus, mulatto, native of Boã Vista, aged 31, examined.

1134. How long were you employed in the launches attending upon the "Eclair?"—Eight days.

1135. Were you on board the ship, or at the Fort?—I was on the island, but not at the Fort; nor was I on board the ship.

1136. Did you return to your house every night?—Yes.

1137. What family have you?—No children. I live with a woman.

1138. Have you had fever?—Yes, after it had become general in Boaventura.

1139. Then you went to Boaventura?—Yes.

1140. You were among sick people there?—Yes, I attended Domingos Soares during his illness.

1141. Have you ever been away from the island?—No.

1142. Have you in general had good health?—Yes.

Manoel dos Santos Conceição, negro, native of Boã Vista, aged 25, examined.

1143. How long were you employed on board the launches?—Six days.

1144. Were you on board the ship or at the Fort?—I was once at the Fort, but not near any of the sick.

1145. Have you had fever?—Yes.

1146. When?—Some time in November last.

1147. Where do you live?—In Pao de Varella.

1148. Had you seen any sick people before you were taken ill?—Yes, I had been with Manoel Affonso when he was sick, and was taken ill very soon after he died.

1149. Is your house near to that in which Manoel Affonso died?—Yes.

1150. How many are there in your house?—Only my wife and myself.

1151. Was your wife attacked?—Yes.

1152. When was she attacked?—Just after me.

1153. Had she seen any sick person besides yourself?—Yes, she had seen Manoel Affonso.

1154. How long were you ill?—Ten days.

1155. And your wife?—Four days; she was a long time weak.

1155*a*. Were you visited by many when you were sick?—Yes, Antonio d'Anninha and Carlotta Varella attended upon us.

1156. Had they the fever?—Yes, both of them.

1157. Have you been about the islands much?—Yes, I have been to all the Cape de Verds and to Bissão.

1158. Have you ever had fever at any of them?—No.

Pedro Ascensão, negro, (slave,) native of San Nicolao, aged 25, examined.

1159. How long were you employed in the launches coaling the "Eclair?"—Five days.

1160. Were you on board the vessel?—Yes, I was on board every day, and the day on which she sailed.

1161. Have you had fever?—No.

1162. Have you been where there were sick people?—Yes. I also buried several fever corpses.

1163. Where do you live?—I in general live with my mistress, Cecilia da Britho, but she went away to Bella Vista when the fever broke out.

1164. Did she escape the fever?—Yes.

1165. Where did you go to when your mistress went to Bella Vista? I went to Boaventura, to attend another slave.

1166. Did this slave die?

1167. And you yourself were never attacked?—No, never.

Sopriano dos Santos, negro, (slave,) native of the coast of Africa, aged 60, examined.

1168. How long were you employed in the launches while the "Eclair" was here?—Six days.

1169. Did you go on board the ship?—Yes, when the launch was being unloaded I used to go on board.

1170. Were you at the Fort?—I was once or twice in the yard, but not amongst the sick.

1171. Have you had the fever?—Yes, I was attacked about the beginning of November.

1172. Had you been among sick people?—Yes; Angela, another slave, was sick in my master's house.

1173. And you attended Angela?—Yes.

1174. How long were you ill?—About six days.

1175. Have you in general had good health?—Yes.

Felipe dos Santos, (slave,) native of coast of Africa, aged 40, examined.

1176. How long were you in the launches while the "Eclair" was here?—Five or six days.

1177. Were you ever on board the ship?—No.

1178. Were you at the Fort?—Yes, I went with a slave called Portajo (since dead) the same day the sick left. We brought with us some pieces of old rope, which had been used in making the tents.

1179. Where did you take this rope to?—We sold it to a Jew in Porto Sal Rey.

1180. What is the name of this man?—I do not know.

1181. Have you had fever?—Yes.

1182. When were you sick?—I was sick just after I had been attending upon Portajo, who died. I also attended others in my master's (João Baptista's) house.

1183. How long were you ill?—Four or five days only.

1184. Have you in general had good health?—Yes.

Manoel Ambrosia, negro, native of Boã Vista, aged 45, examined.

1185. How long were you employed in the launches when the "Eclair" was here?—Two days.

1186. During the early or latter part of her stay?—About the middle.

1187. Were you on board, or at the Fort?—I was at neither.

1188. Have you had fever?—Yes.

1189. When were you taken ill?—Not until the latter end of December.

1190. Had you been with sick people?—Yes, I had been with my mother and my wife's brother, both of whom were sick.

1191. How many are there in your house?—My wife and five children.

1192. Was your wife attacked?—Yes.

1193. Had your mother been to see any sick person?—Yes, she had been to see Jose Moorgita, a slave belonging to Cecilia da Britho.

1194. Were your children attacked?—Yes.

1195. Did they all recover?—Yes.

1196. Have you ever been away from the island?—Yes, I have been at the whole of the Cape de Verd Islands.

1197. Have you ever had fever at any of these until lately?—No.

Rafael dos Santos, a Mandingo negro, (slave,) aged 21, examined.

1198. How long were you in the launches?—Three days, while the "Eclair" was coaling.

1199. Were you on board the ship or at the Fort?—I was at neither.

1200. Have you had fever?—Yes, slightly.

1200*a*. When?—In December last.

1201. Were you among sick people?—Yes, I had waited upon several fever patients in my master's house.

1202. How long were you ill?—Only a few days.

1203. Have you in general had good health in this country?—Yes.

Verissimo da Rocha, mulatto, (slave,) native of Boã Vista, aged 30, examined.

1204. How long were you employed in the launches while the "Eclair" was here?—Eight days.

1205. Were you at all on board the ship?—Yes, I was on the deck.

1206. Did you not go below?—No.

1207. Have you had fever?—Yes, I had fever at Boaventura about the end of December.

1208. Had you seen sick people?—Yes, a great many; I also buried the body of Dr. Kenny.

1209. How long were you ill?—Eight days.

1210. Have you ever been off the island?—No.

1211. Have you in general had good health?—Yes.

Manoel Antonio Ascensao, negro, native of Fogo, aged 32, examined.

1212. How long were you employed in the launches while the "Eclair" was here?—Only two days.

1213. Were you at all on board the "Eclair" or at the Fort?—No, I was at neither.

1214. Have you had fever?—Yes, I was taken ill at Porto Sal Rey in December last.

1215. Had you been among sick people?—Yes, I had seen many sick.

1216. How long were you ill?—Twelve days.

1217. Who attended you?—João Ascensao and Pedro Ascensao*, slaves. They both got fever soon afterwards, but both of them recovered.

Vicente Ignacio, negro, native of Boã Vista, aged 32, examined.

1218. How long were you employed in the launches while the "Eclair" was here?—Two days.

1219. Did you ever go on board the ship?—Yes.

1220. Have you had fever?—No.

1221. When had you the fever?—I have not had fever at all.

1222. Were you in your master's house when his son died?—Yes, I was, and occasionally saw him.

1223. Were you in any other houses where there were sick?—Yes, I was in many sick houses.

LIST of Men who were employed in the Launches while the "Eclair" was at Boã Vista.

Names.	Country.	Ages.	If ever on board "Eclair," or at the Fort.	If have had Fever, and when.	How long in the Launches	Result.
From Cabeçada (Rabil):						
Manoel Rosa	Mulatto native	42	On board last day	Oct. 1845	15 days	Recovered
Manoel Fachina	Ditto	27	Neither	Ditto	6 do.	Ditto
Lucas Domingos	Negro native	38	On upper deck	When Fever was general in Cabeçada	11 do.	Ditto
Silvester Lopez	Ditto	53	Neither	Ditto	4 do	Ditto
Fernino Nazario	Mulatto native	59	Ditto	Ditto	10 do.	Ditto
Manoel da Silva Marques	Ditto	25	On board	After Luis Pathi was brought to Cabeçada, Sept. 1845.	8 do.	Ditto
Joaquim Marques	..	..	..	..	..	Died
Portoliano Evora	..	..	..	..	..	Ditto
Sopriano Gonzalves	..	..	..	..	..	Ditto
Joao Apolinano	..	..	..	..	..	Ditto

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* A mistake, Pedro Ascensao had not fever. Vide Question 1161.

Manoel Rosa, a mulatto, native of Boã Vista, aged 42, examined.
(Cabeçada.)

This man was taken ill about the time that Luis Fortes Pathi was laid up with fever, or soon after.

1224. You were, I believe, employed in one of the launches, watering and coaling the "Eclair?"—Yes, I was fifteen days so employed.

1225. Were you at all, on board the "Eclair"?—Yes, I was on board the day on which she sailed.

1226. What were you doing on board?—I went on board to assist in weighing the anchor.

1227. Were the sick then on board?—They came on board while I was there.

1228. Did you go home immediately the vessel sailed?—Yes, I did.

1229. What family have you?—Two children only.

1230. Were you attacked with fever?—Yes.

1231. When were you attacked?—I do not know when, but it was after Luis Pathi was sick; also after Joaquim Pathi and a child of Manoel Fachina's were taken ill.

1232. Had you seen Luis Pathi or any sick person before you were attacked?—No, I had not seen any sick person.

1233. You are quite sure?—Yes, quite sure.

1234. How long were you ill?—About ten days.

1235. What did you complain of?—General fever, with pain of head and back.

1236. Did any medical man see you?—No.

1237. Were your children taken ill?—Yes, the only one in the house (the other being away in the country) took fever two days after her attendance upon me.

1238. How long was she ill?—She was ill about a week, and had some vomiting, but not black vomit.

1239. When did your daughter return from the country to Cabeçada?—About three weeks since.

1240. Has she had fever?—No.

1241. Did any one else visit your child while you were sick?—Yes, several; my own relations, Maria Angelica, Margarita Marques, and Dorothea.

1242. Did any of them get fever?—Yes, Maria Angelica, five days afterwards.

1243. Had she seen any sick person besides yourself?—I do not know.

1244. Have you ever been away from the Island of Boã Vista?—Only on one occasion; I went to San Antonio for a few weeks, twelve years since.

1245. Have you in general had good health?—Always, until I had the late attack of fever.

Manoel Fachina, a mulatto, native of Boã Vista, aged 27, examined.
(Cabeçada.)

1246. How long were you employed in the launches coaling and watering the "Eclair?"—I was employed only in coaling.

1247. How long were you employed coaling?—About six days.

1248. Were you on board the "Eclair?"—No.

1249. Were you at the Fort?—No, I was only at the coal-heap on the island.

1250. Were you attacked with fever?—Yes.

1251. What family have you?—A wife and one child; I lost one child eight years old, with fever.

1252. Who was first attacked in the house?—My wife and both children were sick before I was.

1253. Had your wife been to visit any sick person?—Yes, she had been a good deal in the house of Luis Pathi, who was sick among the first if not the very first sick at Rabil.

1254. How long was it after Luis Pathi's illness that she was taken ill?—I cannot say how long.

1255. How long was the child ill?—Three days; the last few hours she had black vomit.

1256. Was any one else taken ill in this neighbourhood?—Yes, several: Joaquim Pathi, Manoel Rosa, and others. The fever soon extended over Cabeçada.

1257. Have you ever been away from the island?—No, not since I was a child.

1258. Have you always enjoyed good health?—Yes, always, until lately.

Lucas Domingos, negro, native of Boã Vista, aged 38, examined. (Cabeçada.)

1259. What is your usual employment?—I am patrao, or coxswain of one of Mr. George Rendall's launches.

1260. Were you employed in that capacity when the "Eclair" was here?—Yes, I was coaling and watering that vessel.

1261. How long were you so employed?—About eleven or twelve days.

1262. Were you on board the "Eclair?"—Yes, frequently.

1263. Did you go below?—No.

1264. Were you ever at the Fort whilst the sick were there?—No, I never went away from the coal-heap.

1265. You belong to Cabeçada?—Yes, I do.

1266. When the "Eclair" sailed you returned to your home?—Yes.

1267. Were you taken ill?—Yes.

1268. When were you taken ill?—At the same time with my brother Thomé.

1269. Did you visit him when he was sick?—Yes.

1270. What family have you?—A wife and three children.

1271. Were they taken ill?—Yes, all of them.

1272. Did they all recover?—Yes.

1273. They attended upon you?—Yes.

Silvester Lopez, negro, native of Boã Vista, aged 53, examined. (Cabeçada.)

1274. How long were you employed in the launches attending upon the "Eclair?"—Four days.

1275. Were you ever on board the ship?—No, never.

1276. Did you go to the Fort?—No.

1277. Have you had fever?—Yes.

1278. When?—I do not know the time,

1279. Who was sick in Cabeçada before you were?—Luis Pathi, Joaquim Marques, Manoel Fachina's child, Joaquim Pathi, and others.

1280. How many are there in your house?—My wife and four children.

1281. Who was first taken ill?—My wife.

1282. How long was she ill?—She was twice ill; the first time a week, and the last time fifteen days.

1283. How long was the interval?—A week.

1284. Who was next attacked?—A daughter, called Maria; the fever then passed through the whole family.

1285. You all recovered?—Yes.

1286. Have you and your family in general had good health?—Yes.

Fernino Nazario, mulatto, native of Boã Vista, aged 59, examined. (Cabeçada.)

1287. How long were you employed in the launches while the "Eclair" was here?—Ten days.

1288. Were you on board the ship?—No.

1289. Were you at the Fort?—I went on several occasions to the gate, but I was not among the sick.

1290. Have you had fever?—Yes.

1291. Did you see any sick people before you were attacked?—Yes, I saw my brother Luis Nazario when he had the fever.

1292. How many are there in your house?—My son, his wife, and myself.

1293. Who was first attacked?—Myself, then my son, and his wife.

1294. Had they seen any sick people besides yourself?—Yes, I think so.

1295. Did they recover?—Yes.

1296. Have you in general had good health?—Yes.

Manoel da Silva Marques, mulatto, native of Boã Vista, aged 25, examined. (Cabeçada.)

1297. How long were you employed in the launches when the "Eclair" was here?—Eight days.

1298. Were you at all on board the ship or at the Fort?—I was on board the day the vessel sailed from this island.

1299. Have you had the fever?—Yes.

1300. When were you attacked?—I think there were only three or four persons ill in Cabeçada before I was.

1301. Who was ill before you were?—Luis Pathi, a child of Luis Pathi's, and a child of Manoel Fachina's.

1302. Had you been to see any sick people before you were taken ill?—Yes, I assisted to carry Luis Pathi from Moradinha, and was seized with fever soon after.

1303. How many were there in your house?—Myself, mother and sister.

1304. Who was first attacked in your house?—Myself and my mother on the same day, and very soon after, my sister.

1305. Had your mother seen any sick besides yourself?—I am not sure, but I think not.

1306. How long were you ill?—Three days I had high fever.

1307. How long was your mother ill?—Six days.

1308. And your sister?—Four or five days.

1309. You all recovered?—Yes.

1310. Did many come to see you when you were ill?—Maria Chileco, and some others came to see us; they all got sick afterwards.

1311. Have you ever been on any of the other islands?—No.

1312. Have you in general had good health?—Yes.

Jose Marques, mulatto, native of Boã Vista, aged 62, examined. (Cabeçada.)

This man had nothing to do with the "Eclair," but his evidence is taken, as he lives near Luis Pathi, and was brother to Joaquim Marques, who died of fever in Cabeçada.

1313. Were you at Cabeçada when the fever broke out there?—Yes, I was.

1314. When did the first case show itself in Cabeçada?—There was no fever in Cabeçada until Luis Pathi came, or rather was brought from Moradinha.

1315. What had Luis Pathi been doing at Moradinha?—He was attending the Festa of Santa Cruz.

1316. Did you see him when sick at Cabeçada?—Yes, I saw him and all his family when they were ill.

1317. What did his wife and children complain of?—They all vomited blood and black stuff before they died.

1318. Did many people go to see them?—Yes, my late brother Joaquim and a great many others saw them.

1319. When was your brother Joaquim laid up?—Shortly after Luis Pathi's children died.

1320. Did you attend your brother during his illness?—I saw him occasionally.

1321. Have you had fever?—Yes, and all my family, amounting to six persons.

1322. When were you attacked?—Only a short time after my brother died.

1323. Had any of your family been on board the "Eclair?"—Yes, I had two sons employed on board as labourers.

1324. How long was Joaquim ill?—Seven days.

1325. What did he complain of before he died?—Vomiting blood and black matter.

1326. Did your own family all recover?—Yes.

1327. Do you know who first died in Cabeçada?—Manoel Fachina's child.

1328. You have always slight fever prevailing in Rabil during and after the rains?—Yes, very little, and few people die from it.

1329. During some years a good many have died?—Yes, in 1827 several died.

1330. Also in 1821?—I do not know, I was then in England.

1331. Have you in general had good health?—Yes, very much so.

PART IV.

Contents.

Lists of men who were employed at the Coal-Heap on the Small Island, while Her Majesty's ship "Eclair" was at Boã Vista—

1. From Estacia—Joao Gallego.
2. Rabil—Cabeçada.

With the evidence of the survivors.

3. Evidence of Dr. Almeida.

List of the Men who were employed at the Coal-Heap on the Small Island, while Her Majesty's ship "Eclair" was at Boã Vista.

Names.	Country.	Ages.	How long on Island.	If on board "Eclair" or at Fort.	If attacked with Fever, and when.	Result.
From *Estacia*:—						
Serafin Santos	Mulatto native	23	5 days	Neither.	Nov. 1845	Recovered.
Narcisso Soares	Negro native	25	Ditto	Ditto	End of Oct.	Ditto
Raimond Balthazar ..	Ditto	29	6 days	Ditto	When Fever was general.	Ditto
Pedro Joao Delgado ..	Ditto	20	Ditto	Ditto	Ditto	Ditto
Serafin da Rocha, 2nd ..	Ditto	21	Ditto	Ditto	Ditto	Ditto
From *Joao Gallego*:—						
Parfeiro da Silva ..	Ditto	28	Ditto	Ditto	When Fever was common.	Ditto

Serafin Santos, mulatto, native of Boã Vista, aged 23, examined.

1332. How long were you employed at the coal-heap on the island?—Five days.

1333. Did you go on board the "Eclair?"—No.

1333*a*. Or to the Fort?—No.

1334. Where did you go to at night?—To Porto Sal Rey.

1335. Did you go home to Estacia immediately the ship sailed?—Yes, the same evening.

1336. Have you had fever?—Yes, I have had the fever twice.

1337. When had you the first attack?—I do not know the time; but some people had died at Estacia; among them Justinian da Britho.

1338. When had you the second attack?—I was ill about eight days, and there was an interval of another week in which I was well, and was then again attacked.

1339. How long were you ill the second time?—Only three days.

1340. Had you been among sick people before you were taken ill?—No, I had not been inside any of the houses where there were sick people; but they were all around me.

1341. Did any one take sick in your own house?—Yes, my mother and my two brothers.

1342. Had they been with sick people?—No, they had not been with any one besides me.

1343. Did they recover?—My mother recovered, but my brothers both died.

1344. Have you in general had good health?—Yes.

1345. Who was the first taken ill at Estacia?—Joao Chico Fernandez.

Narcisso Soares, negro, native of Boã Vista, aged 25, examined.

1346. How long were you employed working on the island where the Fort is when the "Eclair" was here?—Five days.

1347. Did you return to Estacia when the vessel sailed?—Yes, I did.

1348. Were you at all on board the "Eclair" or at the Fort?—No.

1349. Have you had the fever?—Yes.

1350. When had you the fever?—I was sick very soon after Joao Chico Fernandez, and he was, I believe, the first person taken ill at Estacia. It was, I think, three days after I saw him that I was attacked, and Justinian da Britho was ill at the same time.

1351. How long were you unwell?—Nearly a month.

1352. How many were there in your house?—My wife and two children.

1353. Were you all attacked?—Yes, first myself, next my wife, and then the children.

1354. Did any of those who visited you during your illness get fever?—Yes, several of them; Antonio Maria and others.

1355. Have you in general enjoyed good health?—Yes.

Raimond Balthazar, negro, native of Boã Vista, aged 29, examined.

1356. How long were you employed at the small island while the "Eclair" was here?—Six days.

1357. Were you inside the Fort, or on board the "Eclair?—No, I was not at either.

1358. Have you had the fever?—Yes.

1359. When had you the fever?—Many in Estacia were attacked before I was.

1360. Had you been among the sick?—Yes, I had seen nearly every one in Estacia who had been sick.

1361. How many were there in your house?—My father, mother, and three brothers.

1362. Who was first attacked?—First myself, and then the others, all about the same time.

1363. Did you all recover?—Yes.

1364. Have you in general had good health?—Yes.

Pedro Joao Delgado, negro, native of San Antonio, aged 20, examined.

1365. How long were you employed on the small island while the "Eclair" was here?—Six days.

1366. Were you on board the ship?—No.

1367. Have you had fever?—Yes, but Justinian da Britho, Joaquina, a woman, and some others were attacked before I was.

1368. Did you visit any of the sick people?—Yes, I saw Chico Fernandez and several others.

1369. Who was first taken sick in Estacia?—I am not sure, but I think Justinian was; Chico Fernandez, I am aware, was ill very nearly as soon as he was.

1370. What did they complain of?—First of pains of head and back; could make no water; and at last black vomit.

1371. How many are there in your house?—There are my mother, father, one brother, and one sister.

1372. Were you all attacked?—Yes.

1373. You all recovered?—Yes.

1374. How long were you ill?—Three weeks.

1375. Have you in general had good health?—Yes.

Serafin da Rocha, 2nd, negro, native of Boã Vista, aged 21, examined.

1376. How long were you at the coal-heap on the small island while the "Eclair" was here?—Six days.

1377. Did you go on board the ship?—No.

1378. Or to the Fort?—No.

1379. Have you had fever?—Yes.

1380. When?—After several others; I had seen Libania, Chico Fernandez, and other sick persons.

1381. How long after you saw them was it that you were taken ill?—Six days.

1382. How long were you ill?—Fifteen days.

1383. How many were there in your house?—Nine persons.

1384. Were they all taken ill?—Yes, they all recovered.

1385. What did you complain of?—Hot skin, headache, and vomiting, but no black vomit.

1386. Have you, in general, enjoyed good health?—Yes.

Parfeiro da Silva, negro, native of Boã Vista, aged 28, examined.
(Joao Gallego.)

1387. How long were you employed at the coal-heap on the small island while the "Eclair" was here?—Six days.

1388. Did you go up to the Fort or on board of the ship?—No, I did not go to either.

1389. Have you had the fever?—Yes, and my family also.

1390. When and where were you attacked?—I was taken ill in Porto Sal Rey, at the time many were laid up.

1391. Did you visit any people who were sick?—Yes, a great many.

1392. How many are there in your family?—My wife and three children.

1393. You all recovered?—Yes.

1394. Have you and your family in general had good health?—Yes.

LIST of Labourers who were employed on the small island at the coal-heap, while Her Majesty's ship "Eclair" was at Boã Vista.

From RABIL—CABECADA.

Names.	Country.	Age.	How long on the Island.	If on board "Eclair," or at the Fort.	If attacked with Fever, and when.	Result.
Gabriel Braz	Negro native	..	5 days	Neither	When fever was general in Cabeçada.	Recovered
Francisco Antonio Ascensao	Do.	18	2 ,,	Do.	Not attacked	
Simaó Fachina	Mulatto native	42	6 ,,	Do.	When fever was general.	Do.
Antonio Julio da Graça ..	Do.	43	5 ,,	Do.	Do.	Do.
Christophe Pinheiro ..	Dark mulatto native	45	5 ,,	Do.	Do.	Do.
Silvesta da Silva Marques	Do.	19	6 ,,	Do.	Oct. 1845	Do.
Joao da Silva Marques ..	Do.	20	6 ,,	Do.	Dec. 1845	Do.
Antonio Fortes	Negro native	35	6 ,,	Do.	Nov. 1845	Do.
Pedro Boãvista	Do.	38	5 ,,	Do.	When fever was general.	Do.
Canuta da Graça	Do.	20	6 ,,	Do.	Nov. 1845	Do.
Luis Joaquim	Do.	24	5 ,,	Do.	When fever was general	Do.
Antonio Julio Monteiro ..	Do.	22	5 ,,	..	End of Nov.	Do.
Da Silva Benthino ..	Do.	38	5 ,,	Do.	When fever was general	Do.
Palequino Fernandez ..	Do.	29	6 ,,	..	Do.	Do.
Francisco San Antonio ..	.. ..	..	..	..	..	Died
Pedro Gomes	.. ..	..	..	..	..	Do.
Cosmo da Cruz	.. ..	..	..	..	..	Do.

Gabriel Braz, negro, native of Boã Vista, aged , examined. (Cabeçada.)

1395. Were you employed on the island where the Fort is when the sick of the "Eclair were there?—Yes, I was five days on the island when the sick were at the Fort.

1396. Did you go on board the "Eclair?"—No.

1397. How were you employed on the island?—I was carrying coals from the coal-heap to the launches.

1398. Did you go up to the Fort among the sick?—No.

1399. Were you at all among the sailors of the "Eclair?"—Yes, I saw them a good deal on the island.

1400. Have you had fever?—Yes, but not until fever was general at Cabeçada.

1401. Do you know any one who was sick at Cabeçada before you were?—I know there were a great many, but I do not recollect names.

1402. Who do you live with?—With my father and mother.

1403. Was your mother taken ill?—Yes, she was attacked before I was.

1404. Had she been much among sick people?—She was daily going to Porto Sal Rey with water; but I do not know whether or not she called to see any sick people.

1405. How long was she ill?—Eight days.

1406. Was your father attacked?—Yes, he was, while my mother was laid up.

1407. And yourself?—At the same time.

1408. Did you all recover?—Yes.

1409. Have you in general had good health?—Yes.

Francisco Antonio Ascensao, negro, native of Boã Vista, aged 18, examined. (Cabeçada.)

1410. How long were you employed on the small island while the "Eclair" was here?—Two days.

1411. Were you at all on board the ship?—No.

1412. How were you employed on the island?—Carrying coals from the coal-heap to the boats.

1413. Were you at the Fort?—No.

1414. Were you at all among the "Eclair's" people?—Very little.

1415. Have you had fever?—No.

1416. With whom do you live?—With my father, mother and sister.

1417. Have they been sick?—No, none of them.

1418. Then were you in Cabeçada while the fever was prevailing there?—No; we all went into the country to a house called Bella Vista, about three miles to the eastward of Porto Sal Rey.

1419. How long did you remain there?—We are there still.

1420. Have you seen any sick people?—Yes, I have: I took goats to the house of Matthew Soares da Graça at Cabeçada, and he was then sick. I stopped one night under the same roof with him, but in a different room.

1421. Did none of the others of your family see sick people?—None of them.

1422. And they all escaped the fever?—Yes, all have escaped.

Simao Fachina, a mulatto, native of Boã Vista, aged 42, examined. (Cabeçada.)

1423. You were employed on the small island when the "Eclair" was here?—Yes, I was six days employed on the island while the "Eclair" was here.

1424. Were you ever at the Fort?—No.

1425. Nor on board the ship?—No.

1426. Were you taken ill with fever?—Yes, but not until many had died from fever in Cabeçada.

1427. Have you a family?—Yes, I have a wife and six children.

1428. Have they had fever?—Yes, all of them.

1429. Did they all recover?—Yes, all recovered.

Antonio Julio da Graça, native of Boã Vista, aged 43, examined. (Cabeçada.)

1430. How long were you employed on the island while the "Eclair" was here?—Five days.

1431. Were you ever on board the ship?—No.

1432. Were you at the Fort?—No.

1433. How were you employed on the island?—I was employed at the coal-heap, and in carrying coals down to the launches.

1434. You went to Rabil every night when you were so employed?—Yes, every night.

1435. Have you had fever?—Yes.

1436. When had you the fever?—Not until a great many in Cabeçada were sick.

1437. Do you know who was the first person taken ill with fever in Cabeçada?—I believe it was Luis Pathi.

1438. What family have you?—A wife and five children.

1439. Were they attacked?—Yes, all of them.

1440. Did you and your wife visit sick people?—Yes, both of us.

1441. Did you all recover?—Yes.

1442. Have you in general enjoyed good health?—Yes.

Christophe Pinheiro, dark mulatto, native of Boã Vista, aged 45, examined. (Cabeçada.)

1443. How long were you employed at the coal-heap on the small island while the "Eclair" was here?—Five days.

1444. Were you ever on board the ship, or did you go up to the Fort?—Neither the one nor the other.

1445. Were you at all among the healthy sailors of the "Eclair?"—Yes; now and then they came down.

1446. Have you had fever?—Yes.

1447. At what time had you the fever?—I think it was some time early in November.

1448. Did you see Luis Pathi?—Yes, I did; I live near to him.

1449. How many are there in your house?—My wife and five children.

1450. Who was first attacked?—My wife; she was in childbed at the time; she was taken with fever.

1451. Had she seen any sick people?—No; but I had, and I had also buried fever corpses.

1452. Had the rest of the family the fever?—Yes, it passed through the whole of them slightly: they all recovered.

1453. Did many people visit you?—Yes.

1454. Have you ever been off the island?—Yes, I have been to St. Jago and Fogo.

1455. Have you ever had fever at St. Jago.—No.

1456. Have you in general had good health?—Yes.

Silvesta da Silva Marques, mulatto, native of Boã Vista, aged 19, examined. (Cabeçada.)

1457. How long were you at the small island during the stay of the "Eclair" at this place?—Six days.

1458. Were you ever on board the ship or at the Fort?—I was not at either.

1458*a*. Have you had fever?—Yes.

1459. When were you attacked?—At the same time with Joaquim Marques and his family.

1460. Then were there many sick people in Cabeçada at this time?—Yes, many.

1461. Had you visited any sick people before you were taken ill?—No.

1462. How many are there in your house?—My father, mother, and four children.

1463. Who was first attacked in the house?—A brother of mine called Antonio.

1464. Had he seen sick people?—Not that I know of.

1465. You had a brother who also worked on the island at the coal heap?—Yes; he was also taken ill and myself the same day.

1466. Did you all recover?—Yes.

Joao da Silva Marques, dark mulatto, native of Boã Vista, aged 20, examined. (Cabeçada.)

1467. Are you the brother of Silvesta da Silva Marques?—Yes, I am.

1468. How long were you employed in the small island?—Six days.

1469. Were you ever on board the ship or at the Fort?—No.

1470. Have you had fever?—Yes, I have.

1471. When were you attacked?—Very shortly after Luis Fortes Pathi.

1472. Do you live near him?—Yes.

1473. How many are there in your house?—My father, mother, and three brothers and one sister.

1474. Who was first attacked?—My brother, who is called Antonio.

1475. Had he been among sick people?—I do not know.

1476. How long was he ill?—Only two days.

1477. Who was next attacked?—My brother Silvestion and myself, the same day; my father and mother also had fever; but all recovered.

1478. Have you, in general, had good health?—Yes.

Antonio Fortes, negro, native of Boã Vista, aged 35, examined. (Cabeçada.)

1479. How long were you employed on the island?—I was six days at the coal-heap.

1480. Were you ever on board the "Eclair" or at the Fort?—No, never at either.

1481. Did you go among the healthy sailors on the island?—Yes, they often came down to the coal-heap.

1482. You returned to Rabil every night?—Yes.

1483. Have you had fever?—Yes, I have.

1484. When had you the fever?—In November last.

1485. How many are there in your house?—A wife and two children.

1486. Had you all fever?—Yes, I was first attacked, then my wife, and afterwards the children.

1487. Did they all recover?—Yes, all of them.

1488. Have you in general enjoyed good health?—Yes.

Pedro Boã Vista, dark mulatto, native of Boã Vista, aged 38, examined.

1489. How long were you employed on the small island while the "Eclair" was here?—Five days.

1490. Were you ever up at the Fort?—No.

1491. Nor on board the "Eclair?"—No.

1492. Have you had fever?—Yes, and all my family of five persons.

1493. When had you and your family the fever?—Not until fever was general at Cabeçada.

1494. Had you visited sick persons?—Yes, I had seen Luis Pathi, Joaquim Marques, and many others. I live in that part of the town where the sickness was greatest at the first.

1495. Did all in your house recover?—Yes.

1496. Who was first sick in Cabeçada?—Luis Pathi.

1497. Have you ever had slight fever which prevails at Rabil during or after the rainy season?—No, but I have known people to have that fever; it does not last long, and very few die.

1498. You have that fever prevailing in Rabil every year?—Very little indeed, and not every year.

Canata da Graça, dark mulatto, native of Boã Vista, aged 20, examined. (Cabeçada.)

1499. How long were you employed on the small island while the "Eclair" was here?—Six days.

1500. Did you ever go up to the Fort or on board the ship?—Neither to the one or the other.

1501. Did you go to your home at Rabil every night?—Yes.

1502. Have you had fever?—Yes, but not until November, when a great many were sick.

1503. How many are there living in your house?—My mother and three brothers.

1504. Were they attacked?—Yes.

1505. Had you or they been among sick people?—Yes, all of us had been to see most of the people who had been sick in Rabil.

1506. Did they all recover?—Yes.

1507. Have you and they, in general, had good health?—Yes, always until we had the fever lately.

Luis Joaquim, negro, native of Boã Vista, aged 24, examined. (Cabeçada.)

1508. How long were you employed on the small island while the "Eclair" was here?—Five days.

1509. Were you ever on board the ship or at the Fort?—No, I was not at either.

1510. You went to Rabil every night?—Yes.

1510*a*. What family have you?—A wife and two children.

1511. Have they had fever?—Yes, they all recovered.

1512. Who was first attacked?—Myself, and then my wife and the children.

1513. Had you been among sick people?—Yes, I had seen almost all that were sick before me in Rabil.

Antonio Julio Monteiro, negro, native of Boã Vista, aged 22, examined. (Cabeçada.)

1514. You were employed some time at the coal-heap on the small island while the "Eclair" was here?—Yes, I was five days so employed.

1514*a*. You went home to Rabil every night?—Yes.

1515. How many are there in your house?—My father, mother, grandmother, and four brothers and sisters.

1516. Were you attacked with fever?—Yes.

1517. Who in your house was the first attacked?—My father, José Angela. He was taken ill about the 27th of November.

1518. Was your mother attacked?—Yes; and myself and children in succession; next my grandmother.

1519. Did you all recover?—No, my grandmother died.

1520. Had you and your family been among the sick people?—Yes, a great deal.

1521. Have you in general had good health?—Yes.

Da Silva Benthino, negro, native of Boã Vista, aged 38, examined. (Cabeçada.)

1522. How long were you employed on the island where the Fort is?—Five days.

1523. Did you go up to the Fort or on board the "Eclair" on any occasion?—No.

1524. Have you had fever?—Yes, but not until Joaquim Marques and some others had it.

1525. How many persons are there in your house?—My mother, wife, niece and myself.

1526. Were they all attacked with fever?—Yes; first my mother, next my wife, then my niece and myself about the same time.

1527. Had your mother been among the people who were sick?—Yes.

1528. Did you all recover?—No, my niece died.

1529. Had she attended the others in the family who were sick?—Yes, all of the others.

1530. Have you always had good health until lately?—Yes.

1531. Have you been at any of the other islands?—No, I never was away from this island.

Palequino Fernandez, negro, native of Boã Vista, aged 29, examined. (Cabeçada.)

1532. How long were you employed on the small island?—I was at the coal-heap six days.

1533. Have you had fever since the time you were on the island?—Yes.

1534. How many are there in your house?—My father, mother, and three brothers.

1535. Were they all attacked with fever?—Yes; first my father, then my mother, then my brothers, and last myself.

1536. Did you all recover?—Yes.

1537. How long was each of you ill?—From three to eight days.

1538. When was your father attacked?—Not until many had died in Cabeçada.

1539. Have you in general had good health?—Yes.

Dr. Hypolito José Xavier d'Almeida, native of Portugal, aged , examined.

1540. How long have you been on this island?—Thirty-seven years.

1541. During that time what fever have you known to prevail here?—I have known intermittent and remittent fevers to occur here after the rains.

1542. You mean on the island generally?—No, only on the banks of the Rabil ravine.

1543. But you have seen remittent fever at Porto Sal Rey?—I never knew a single case of either remittent or intermittent fever to originate at Porto Sal Rey; people who have got remittent at Rabil, have often come to Porto Sal Rey to get well.

1544. Then do you mean to say that remittent fever is confined to the Rabil ravine?—Yes, I do.

1545. Then at what time of the year does the Rabil fever occur?—It does not occur every year, in fact we have not had it for the last four years; when I say this, there may have been one or two cases, but they were of so trifling a nature that I never heard of them. Remittent never appeared before September, October, or November, and not after January and February.

1546. What months are comprehended in the term rainy season?—August, September, and part of October.

1547. Can you tell me when the rainy season began, and ended last year?—Some rain fell in August, and it continued until the middle of October.

1548. Was there more rain last year than usual?—No, I think not. I have seen many seasons in which there was much more rain than there was last year.

1549. The visitations of remittent have been severe here, during some seasons. Can you tell me in what years they occurred?—In 1821-22, 1827, and 1833.

1550. What was remarkable in the state of the weather during those years?—Nothing, that I am aware of.

1551. Have you any idea of the rate of mortality during the years you have mentioned; I mean from remittent alone?

In 1821-22 there died about . . .	33
In 1827	13
In 1833	15

1552. Did the deaths all take place at Rabil?—Nearly all. Some went away and died in the other villages, but very few.

1553. Was there no remittent fever in Porto Sal Rey during these years?—None, not a case.

1554. Were you here when Her Majesty's ship "Eclair" arrived in August last?—No, I was then at the Island of Sal, but I came here four days after her arrival.

1555. How long had you been at Sal?—Two months.

1556. Was Sal quite healthy when you left it?—Yes.

1557. What was the state of health on this island when you arrived from Sal?—With the exception of the people of the "Eclair," there was general health throughout the island.

1558. You were, I understand, requested to see the people of the "Eclair?"—Yes, I was requested by the Governor to go to the Fort and see the sick of the "Eclair" there.

1559. How did they seem to be lodged there?—They seemed to be extremely crowded. I could hardly pass between them. In one small room there were about twelve sick persons.

1560. How many sick were there altogether when you visited them at the Fort?—I should say about thirty, if not more.

1561. What was the disease with which the crew of the "Eclair" were at this time affected?—Yellow fever.

1562. Have you ever seen this disease before at Boã Vista?—Never.

1563. Did you return to your house in Porto Sal Rey after paying this visit?—Yes, I did.

1564. Did you go to the Fort a second time?—No, shortly after this I went to Fundo das Figueiras, on the north side.

1565. How long did you remain at Fundo das Figueiras?—I remained there until the 19th or 20th of October, when I heard that fever had appeared in Porto Sal Rey, upon which I returned to Porto Sal Rey, where I found about twenty people sick.

1566. Did you see any of them?—Yes, in all about 150.

1567. What was the nature of their disease?—The same fever as that which the crew of the "Eclair" laboured under when I saw them at the Fort.

1568. You are quite sure it was the same kind of disease?—Yes, quite sure. It was in some cases in a degree modified by the patients being black or white.

1569. In your practice how long did the disease last,—I mean the fatal cases?—From three to seven days.

1570. What proportion of the inhabitants was attacked?—I should say more than two-thirds.

1571. How long did you remain in Porto Sal Rey?—Until the 30th of October.

1572. Where did you go to then?—To my country-house at Boã Esperança, about a mile and a-half from Porto Sal Rey.

1573. How long did you remain at Boã Esperança?—I was there until the 19th of November, when I removed with my family, amounting with slaves to 56 persons, to Fundo das Figueiras.

1574. Did you find any sick at Fundo das Figueiras?—No. But it was said that one man had been sick. In a few days after I got there, a man called João Baptista da Cruz came from Rabil, and was taken sick in the course of a few days; in a week or ten days after this, his mother and sister were taken ill, and both died. However I got sentinels placed on each side of Fundo das Figueiras, and prohibited communication with João Gallego and Cabeça dos Tharafes, in both of which places fever was raging. I also put the sick into one house, and kept the same nurses always with them. By these means I kept the fever under until the middle of December.

1575. How long then, do you think, did the segregation of the sick and the sanitary cordon you formed prevent the spread of the disease?—At least three weeks.

1576. But how did the fever get to Fundo das Figueiras after all your precautions?—A man called Antonio José, whose sister was at the time dying from fever, came from João Gallego. He was taken ill in a house where he had gone to, and continued there.

1577. In which of the three eastern villages did fever first appear?—In Cabeça dos Tharafes, and the first person attacked was a little girl called Aniceto.

1578. About what time was this?—Late in October, I believe.

1579. When did the fever appear in João Gallego?—Early in November; the first sick there were two soldiers who came from the barracks in Porto Sal Rey, where fever was raging.

1580. When did you leave Fundo das Figueiras?—On the 23rd of December.

1581. Was there much fever at this time?—Yes, there were a good many cases.

1582. Where did you go to?—To Boã Esperança.

1583. What treatment did you find to answer best during the late fever?—Cupping; local bleeding was generally beneficial; general bleeding was rarely adopted; blisters, enemata, and saline purges.

1584. Did you not give mercury?—No.

1585. What reasons have you for supposing that the fever was contagious?—Because, as a general rule, all those who visited fever patients caught fever; while all those, and there were many, who went into the country, away from patients, were never attacked.

1586. But still, notwithstanding the segregation of the sick and the establishment of a sanitary cordon at Fundo das Figueiras, fever at length broke out there?—Yes. But the means I had at command, both for segregation of the sick and the prevention of intercourse with the infected towns, were very imperfect; and on this account the man Antonio José came undiscovered from João Gallego.

1587. Then do you think the fever was propagated from the house of Antonio José?—Certainly. By those who attended him.

1588. Did he recover?—No.

Relative to the State of Health on the other Islands of the Cape de Verds Group.

Dr. Deas to Dr. Mc William.

Monsieur, *Ile de Saint Nicolas, 31 Mars, 1846.*

EN réponse à la question que vous m'avez adressée ce matin, j'ai à vous répondre que je ne connais aucun fait qui prouve qu'il y ait eu dans cette île ou dans les autres de cet archipel aucun cas de fièvre jaune, excepté dans l'Ile de Boã Vista où elle parait maintenant.

Ici il y eu quelquefois des fièvres endémiques et épidémiques, mais elles ne présentaient pas les symptômes qui caractérisent celle qui désole actuellement Boã Vista.

Depuis mon arrivée d'Europe (il y a déjà neuf ans) je n'ai pas eu l'occasion d'observer aucun cas de ces fièvres, parceque heureusement nous en avons été libres; par conséquent je ne puis pas affirmer si elles étaient ou non contagieuses; cependant l'opinion générale, joint à quelque souvenir que j'en ai conservé, me portent à croire qu'elles ne l'étaient pas, sans que toutefois je puisse vous informer à quelle classe elles appartenaient.

Agréez, &c.
(Signé) J. J. DIAS, D.M.P.

PART V.

General Remarks.

Her Majesty's steam-vessel "Eclair" arrived at Boã Vista, one of the Cape de Verd Islands, from the west coast of Africa, on the 21st day of August, 1845.

Her crew were then still suffering from fever, which first appearing early in the previous June, when the vessel was stationed at the mouth of the Sheabar River, had again broken out after she had proceeded to Sierra Leone, and remained there for some time. Here the crew, in addition to other duties, were employed in cleaning out the hold of the "Albert" steam-vessel, which had been engaged in the Niger Expedition, as well as that of their own vessel, and afterwards were allowed to go on shore during the period of the rains. Many stopped till it was late; several slept on shore for some nights; some were brought in from the country by the police; and six or seven deserted altogether, and were no more heard of.

Leaving Sierra Leone after a stay of eighteen days, the "Eclair" stood to the northward, with the "Albert" in tow, and anchored at a considerable distance from the shore, where both vessels remained from the 28th of July to the 8th of August; upwards of twenty of "Eclair's" men being in the meantime still engaged on board the "Albert," cleaning and in other ways preparing that vessel for the service of the Government at the Gambia.

The "Eclair" went into the Gambia on the 10th of August, and having delivered up the "Albert" to the authorities there, left on the 15th of the same month. On her way to Boã Vista, she called at Goree to deliver despatches, and obtained a small quantity of coals*; but the Government there did not consider it proper, under the circumstances of her sickly condition, to permit further intercourse with the shore.

Meanwhile the fever was steadily gaining ground; for, in addition to those who were on the sick list when the vessel left Sierra Leone, three of the men who had slept on shore there were attacked with fever, and died. A merchant from Sierra Leone, who was taking a passage, also died of fever on the 27th July; and fifteen new cases were added in

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* The launches with the coals were towed by the Goree people to within a short distance of the "Eclair," and were then picked up by her crew.

August, before the vessel reached Boã Vista (on 21st August), of which seven were eventually fatal.

Immediately the "Eclair" anchored at Boã Vista, the British Consul sent a boat off to her; but when this boat reached the vessel, Captain Estcourt (in all probability with the fact of his being refused pratique at Goree still fresh in his memory, and desirous to act with prudence) declined having any communication with her, and stated that there were several cases of fever in the ship, which might possibly subject her to quarantine.*

The boat upon this returned to the shore, and Captain Estcourt wrote a full and detailed account of the state of his ship to Mr. John Rendall, Her Majesty's Consul, which was immediately communicated to his Excellency the Governor-General, at the time residing at Boã Vista; and as there was no Portuguese medical man then on the island, Mr. Kenny, the English surgeon, was commissioned by the Governor-General to inquire into the nature of the disease prevailing on board the "Eclair." Mr. Kenny accordingly proceeded on board the "Eclair," and after communicating with the medical officers of the ship, and looking at several of the sick, returned to the shore and reported that the disease in the "Eclair" was the common endemic fever of the African coast, which was not of a contagious or infectious nature.*

Upon this representation, the authorities at Boã Vista without further hesitation at once granted the "Eclair" free intercourse with the shore. The Captain and first engineer landed the same afternoon; and John Jamieson, the Consul's storekeeper, accompanied the engineeer on board in the evening, and brought on shore with him several bags of soiled linen, which he deposited for the night in one of the Consul's storerooms, and the next day distributed them among the washerwomen of the town.†

Shortly after the ship was at Boã Vista the crew were again employed removing tanks, clearing holds, &c.

On the 25th August, the whole of the sick were moved into the captain's cabin, and Captain Estcourt went to live at the house of Mr. Macaulay, Her Majesty's Commissioner Judge of the Mixed Commission Court at Boã Vista.

The number of fever cases continuing to increase, it was next judged advisable to try the effect of removing them to the shore; and the Governor-General having, the moment he was made aware of this intention, in the most prompt and handsome manner placed a fort situated on a small island at the entrance of the harbour, at the disposal of Captain Estcourt, for the use of the sick, they were all landed there on the 31st of August‡. The healthy portion of the crew were also lodged within the walls of the Fort, but in apartments separate from those of the sick.

This small island lies in a direction about south-east and north-west, within the northern extremity of an extensive bay on the western side of Boã Vista, and is about half a mile distant from Porto Sal Rey, the chief town of that island. It is rather less than a mile in length, and under a quarter of mile in its greatest breadth; and is composed of a basaltic base with a calcareous incrustation on the surface. On the north-eastern side the rock rises to the height of about fifty feet, with a tendency to the tabular form, and of a distinctly columnar structure. Towards the north-western end it gradually shelves down to the sea, and is margined by a conglomerate of broken and rounded fragments of basalt, pieces of coral and shells, held together by a calcareous sandstone. The Fort Duke of Braganza stands upon a bare hill of basalt, from forty to fifty feet above the sea level, near the southern end of the island. The whole building is in a state of disrepair, if not of dilapidation. The court-yard is ninety-three feet long and fifty feet broad. Some sheds and huts in a ruinous state extend along each side of the yard, and were, I believe, assigned to the healthy part of the crew. The house in which the sick were lodged consists of two floors. The upper floor which contains one room sixteen feet square, and two others exactly half that size, is well provided with windows, and

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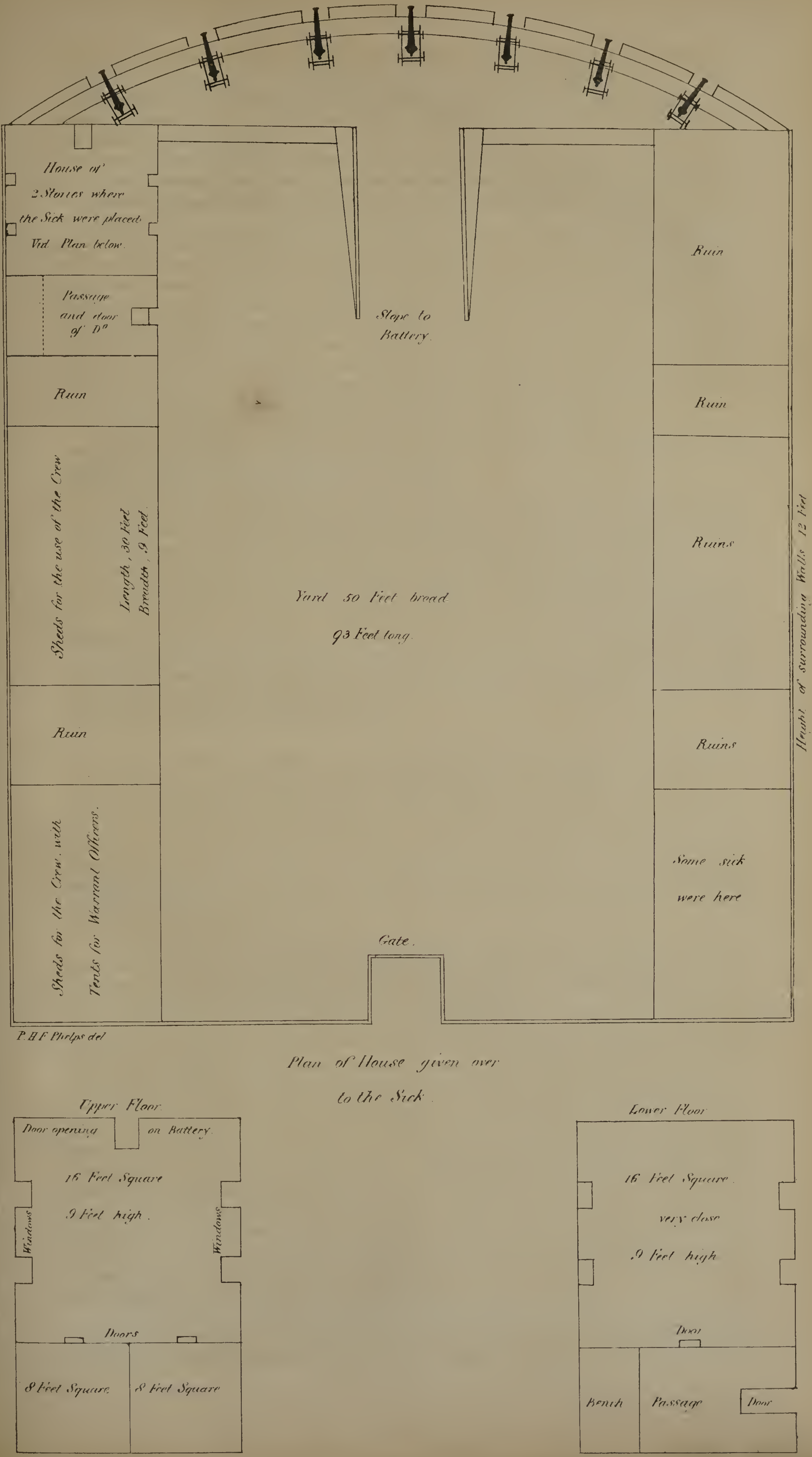
* Vide Question 4.

† Vide Question 5.

‡ Dr. Stewart's Report. Mr. Macaulay says it was on the 28th August.

Plan of Fort Duke of Braganza.

On the Small Island off the Island of BOA VISTA where the Sick were landed from the ECLAIR Steamer, in September, 1845.



is exposed to the breeze. The under floor is of the same dimensions as the upper one, but is somewhat differently arranged; that part corresponding to the small upper rooms, forming a passage to the larger room, which here has only one small window opening to the wall of the steps leading to the rampart.

The whole of this lower floor is close, hot, and miserably ventilated.

The disease did in no degree abate after the sick were in the Fort; on the contrary, it seemed daily to acquire fresh virulence. On the 8th September, Mr. Charles Hartman, assistant surgeon, died, and was replaced by a volunteer, Mr. Charles Coffey, assistant surgeon of Her Majesty's ship "Growler," which ship had two days before arrived at Boã Vista from the coast of Africa. The unremitting attention of Mr. Hartman to his sick shipmates, which ceased not until within a short period of his death, had justly endeared him to all on board. At the same time Dr. Maclure, a naval surgeon who had just been promoted, and was thus far on his way home as a passenger in the "Growler," with noble devotion, proffered his services to relieve Mr. Maconchie, the surgeon of the "Eclair," now almost worn out by constant attendance upon the sick.

On the 11th September, Captain Estcourt, whose whole time had been engaged in cheering, consoling, and supporting his sick crew, was himself taken ill, and at once conveyed to the Fort.

The "Eclair" had been now just three weeks at Boã Vista, and the disease, instead of being checked, as had been hoped, was daily gaining strength—not less than sixty fresh cases had in this short period been added to the sick list, and some deaths had taken place nearly every day.

With appearances so formidable, Captain Buckle, of the "Growler," directed a consultation of the medical officers to be held on the state of the crew of the "Eclair," which resulted in their recommending that vessel to proceed to Madeira, and in the event of no material improvement taking place by the time she arrived there, to go on to England. The whole of the sick were therefore re-embarked on the afternoon of the 13th September, and the same evening the "Eclair" in company with the "Growler" sailed from Boã Vista.

It is now time to take into consideration the occurrences that took place while the "Eclair" was at Boã Vista, with reference to the intercourse that existed between the inhabitants and the ship, the officers living at Porto Sal Rey, and the sick as well as the healthy part of the crew, while they were at the Fort. Before, however, entering upon this the most important part of the report, it may be well to give a brief sketch of the more prominent features of the island, reserving the details relative to the towns until the progress of the fever comes to be discussed.

Boã Vista, the easternmost of the Cape de Verds group, lies in latitude 16° 5′ north, and longitude 22° 55′ west. It is of an irregular pentangular form, indented on all sides by bays, of which that only on the western side is now resorted to by shipping.

The plateau of the island, which rises at the distance of from a quarter of a mile to a mile from the sea, is of an average elevation of about sixty feet above the sea level, and is composed chiefly of sandstone of various degrees of compactness, lying upon a bed of basalt. This disposition of structure is beautifully displayed at the village of Rabil, and in some of the deep water-course sections on the north-eastern side of the island, where strata of sandstone to the depth of forty feet are seen resting upon the igneous rock underneath. The principal mountain range traverses the centre of the island, from south-east to north-west. On each side of it there are inferior hilly ranges. Mount Ochello on the north-east side, and Píco d'Estacia, or south mountain, on the southern side of the island, have both a greater altitude than that of the highest part of the chief range. By a barometric measurement Píco d'Estacia was found to be 1260·5 feet above the level of the sea.

The whole of the mountains have a capping of basalt, which in many of them, especially on Man Mountain on the west side, is being detached from the top, rolling down the sides in huge masses. The sides of the mountains are observed variously streaked and coloured by the basalt passing into different stages of disintegration. The north-western part of the island, from the plateau round Pico Reshee, to the base of the north-eastern extremity of the mountain range (with the exception of an undulating elevated hilly belt on the windward side) is comparatively low and flat, and almost wholly occupied by sand, which, blown up from the north-eastern shore through the water-courses and other hollows, accumulates in mounds twenty and thirty feet high, which are driven about and shifted by every little variation of the direction of the wind.

On the flat, a little to the southward of the Saltpan, marked in the chart as situated between Porto Sal Rey and Rabil, the sea, when the waves are high, sometimes breaks over the elevated beach, and percolates through the shingle so as to accumulate, and run inland in the form of a narrow creek from 200 to 300 yards from the sea-shore. During the rainy season, this, in common with the other flats on the island, is inundated to a considerable extent, as is evident from the appearance of the soil in those places not covered with sand, as well as by the presence of a rude raised causeway, which the people have constructed over part of the hollow flat, to render it passable during the rains.

On one occasion only while I was at Boã Vista, did the sea extend beyond its natural boundary (in June), and deposit some pools on the opposite side of the beach. Except in this instance, this part of the flat was dry and almost wholly covered with sand, through which a species of *sedum* and clumps of another shrub were struggling for existence.

Except salt, which is produced by the spontaneous evaporation of sea water in pans hollowed out in the soil, the island produces little. A quantity of the *lichen rocella* is I believe occasionally exported. I saw several large herds of bullocks on the southern side of the island; and throughout the whole island the goat seems to abound. In the dry season it seems a matter of wonder how these animals can subsist; for when viewed from one of the mountains there is nothing seen to relieve the uniformly arid and barren aspect of the ground, save in the beds of the water-courses, where occasional cocoa-nut trees and patches of corn in a rude state of cultivation give some token of vegetable life.

The water is generally brackish, and in some places it is difficult to get any fit for use. Good water, however, is obtained at Estacia, near the south-western base of Platform Hill; and Dr. Almeida has an abundant supply for a considerable population, at his country residence, called Boã Esperança, about a mile and a half to the south-east of Porto Sal Rey.

The towns and villages are, first, *Porto Sal Rey*, which stands at the northern end of the bay on the western side of the island.

Rabil, or the New Town of the chart, about four miles to the southward of Porto Sal Rey.

Estacia, Povoçao Velha, or Old Town, is situated at the south-western base of Platform Hill, about six miles to the south-west of Rabil.

The eastern villages, *Joao Gallego, Fundo das Figueiras*, and *Cabeça dos Tharafes*, are all on the eastern side of the mountain range, the road leading to them being about fifteen miles from Porto Sal Rey.

Besides these, there are several small hamlets which will be afterwards spoken of.

The inhabitants consist chiefly of dark mulattoes of various grades of European intermixture; free and enslaved negroes; with a small proportion of Europeans, principally Portuguese and English.

The male natives are employed in working at the salt-pans, loading vessels, cultivating corn and beans, and occasionally cotton, in the water-courses, fishing, herding goats and cattle, and carrying wood and water to the towns for sale. Unaccustomed to anything beyond the mere necessaries of life, their wants are but few, and are generally (except during periods of great scarcity, as of late) within the pale of their own resources. A little fish, some wasted Guinea corn, or a few beans, furnish the ordinary meal.

To return now to the "Eclair."

At the time the crew of the "Eclair" were landed at the Fort, the officers (gun-room midshipmen and warrant) took up their residence at a house in Porto Sal Rey, which had been hired for them by the British Consul. The necessary duties on board the ship were carried on under the superintendence of Mr. (now Commander) Harston, the First Lieutenant. These comprehended clearing the holds, cleaning ship generally, and watering and coaling her.

The first of these duties had been already commenced by the Kroomen of the ship, assisted by two white seamen. The operations of coaling and watering were performed with launches belonging to Mr. George Rendall, and other merchants of the place, manned by mulatto and negro natives. There was at first an understanding with the natives, that they were not obliged to do duty below the upper deck of the ship; nevertheless, of the forty who were employed upwards of a week on board, hoisting in coal-bags and water-casks, several assisted in cleaning, whitewashing and restowing the holds; most of them were, during some period, on the lower deck; and nearly the whole, including the launchmen, were on board the day the ship sailed, and after the sick had returned from the Fort.

There were on board the "Eclair" as labourers—

From Porto Sal Rey	9
Rabil (Cabeçada)	20
(Boaventura)	10
Estacia	2
Total	41

The launches were employed between the coal-heap (about 300 yards to windward of the Fort on the small island) and the ship, and between the watering-place, about a mile to the southward of the anchorage, and the ship.

In the launches there were from

Porto Sal Rey	13
Rabil (Cabeçada)	10
Total	23

The number of men in the six launches seems small, but the crews were made up as occasion required by the labourers on board the ship. The patrao, or coxswain, of the launches generally went on board the vessel while the boat was being discharged, and sometimes part of the crew did the same*

At the coal-heap on the small island there were as labourers, from

Rabil (Cabeçada)	17
Estacia	5
João Gallego	1
Total	23

The whole of the labourers on board and on shore, as well as the launch-men, went to their respective homes every night, except those from Estacia and the eastern villages, who generally slept at Porto Sal Rey†.

The coal-heap labourers as well as the launch-men mixed freely on the island with those of the "Eclair's" people who were not on the sick list‡; but it does not appear that any of them (with the exception of a slave who aftewards died) visited the rooms where the sick were lying§. Some of them, indeed, went to procure water from a tent near the gate of the Fort, but they never went where the sick were. Dr. Almeida from Porto Sal Rey, visited the sick once, as did also Mr. Kenny more than once, indeed frequently. A native called José Pedro occasionally brought supplies from the country to the crew, and he was very strongly suspected of having smuggled spirits into the Fort. John Jamieson, the Consul's storekeeper, who superintended the launches on shore, and the soldiers of the guard, were the only persons belonging to the island who had daily intercourse with the sick crew.

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* Vide Questions 1121, 1169, 1262, 1298.

† Vide examinations of launch-men, &c., passim.

‡ Vide Questions 1399, 1414, 1445, 1481.

§ Vide Questions 1131, 1144, 1170, 1289.

It cannot, therefore, be said that there was much direct intercourse between the people of Boã Vista and the sick at the Fort. The boats that were from time to time sent by the British Consul with supplies from the island were equally careful with the labourers not to enter the Fort; indeed it was for some time in vain that the Consul endeavoured to procure labourers for the "Eclair," such was their dread of the disease with which her crew were affected.

It has been already mentioned that the soiled linen brought from the vessel on her first arrival was given out to be washed by the washerwomen of the town. Of these there were not less than seventeen employed washing the linen; and all of them, with the exception of an old negress, were attacked with fever, of which four died*.

I have examined the whole of the survivors, and have found that two were attacked late in October, five in November, two in December, three in January, and one not until some time in February†. None of the deaths took place until fever was general in Porto Sal Rey‡. So that in none of these cases can the occurrence of the fever be fairly attributed, to infectious matter conveyed by the linen.

The house in which the officers lived is situated close to the sea shore in that part of the town of Porto Sal Rey called Santa Barbara; they and their servants were daily in various parts of the town. The purser was for some days in the house of Mr. Kenny, the surgeon, and while there was affected with a nervous disorder. Some of the other officers, the captain's cook, and some other servants, were taken ill at the house in Santa Barbara; but they as well as the purser§ were (in accordance with a stringent rule laid down by Captain Estcourt) sent to the Fort as soon as they were attacked.

Leave was given during the early part of the stay of the "Eclair" at Boã Vista, to the petty officers and a few of the sailors; and a man called Smith stopped in the town two nights. The seamen seemed to have resorted chiefly to the house of a man called Justinian da Silva Georgio, who keeps a spirit-store in Porto Sal Rey. It is remarkable that this man was attacked with headache and general fever on the evening of the day he was visited by the "Eclair's‖" people; he was attended by Dr. Almeida and seen by many of his friends during his illness, which lasted a fortnight; amongst the latter were two females, called Anna Gaspar and Rosinha San Antao, both of whom had slight fever shortly afterwards. It is but necessary to mention that both these women had been visited by people from the "Eclair¶;" they soon recovered, and their illness at the time attracted no notice whatever.

The last, and perhaps in the present inquiry the most important of all the parties connected with the "Eclair" at Boã Vista, was the military guard stationed in the Fort during and immediately after its occupancy by the crew of that vessel.

When the crew took possession of the Fort they found a guard of three soldiers there. They had been on this post already three or four days. Their names were—

Athanasio Perez, Acting Corporal, dark mulatto, aged 26 years;
Pedro Manoel, private, negro, aged 30;
Antonio dos Santos, private, mulatto, aged 25.

This guard slept in front of the upper room occupied by the sick, and often went into it**. The corporal had a headache two days after the sick were landed, which at first yielded to cooling fomentations††. In two days more he and his comrades were relieved, and he was still rather unwell, but making no complaint was posted as a sentry at the barracks in Porto Sal Rey. He was however soon taken ill, and sent to his house in Pao de Varella, where he was confined some weeks. His case caused no alarm, nor was he attended by any medical man, further than being seen once by Dr. Almeida during his convalescence. The other two soldiers had also attacks of fever, the one three weeks or so[*] after he left the Fort, and the other not until fever was general in the barracks[†].

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* Vide Question 7.

† Vide Questions from 8 to 138 *passim*.

‡ One died in November; her brother, who came from San Nicolao during her illness, was also attacked with fever, and died in a few days. One died in the month of December; the other two died in January, and they had nursed each other.

§ I cannot make out clearly whether the purser was sent to the Fort or to the ship. Mr. Macaulay says "he laboured under delirium tremens."

‖ Vide Questions 392 to 402.

¶ Vide Questions 369, 379.

** Vide Questions 142, 157, 166.

†† Vide Question 144.

The second guard at the Fort consisted of—
Vicente da Cruz Silva, dark mulatto native, aged 29;
Manoel Antonio Alves, negro native, private, aged 18;
Luis Briza, European Portuguese, private, aged 18.

The guard was on duty at the Fort six or seven days; none of them were at all affected during this time. They however all had fever afterwards, when the disease was prevalent in the town, of which Luis Briza, the European, died.

Third guard. In the routine of duty the second guard was relieved by
Corporal Joaquim Agostinho, European Portuguese;
Private João Alexandre Roque, European Portuguese; and
Private Miguel Barbosa, native negro, aged 30.

By the evidence of Miguel Barbosa, the only survivor of this guard, it appears that he and his comrades were at the Fort several days before and after its evacuation by the sick of the "Eclair." They slept in a small cook-house under the rampart. The same day the "Eclair" left, Miguel was ordered by the corporal Agostinho to sweep out the rooms which had been occupied by the sick, and that all three of them went into the rooms on this occasion[‡]. According to his account, on the day after the steamer sailed, the corporal was attacked with fever and died in three days, delirious, and vomiting a black fluid. The other European, João Alexandre Roque, was similarly seized on the day following, and died on the fourth day with fever, delirium and black vomit[§]. Both these men were seen by Dr. Almeida, who told me they were in *articulo mortis* when he was called to them.

Pedro Manoel, a native negro soldier, was sent by Major Mascarenhas, the Military Commandant, to attend the sick soldiers at the Fort; he was with them from an early period of their illness up to the time of their death, and remained at the Fort for several days afterwards, in company with Miguel Barbosa[‖]. Before they left the Fort some gunpowder was exploded in the rooms which the "Eclair's" people had occupied; and it is said that they were whitewashed some time afterwards[¶].

Another negro soldier, called Manoel Antonio Alves, who was on duty with the second guard, was ordered by the Commandant to bury the bodies of Agostinho and Roque. For this purpose he proceeded to the small island accompanied with Joaquim Farenga and Manoel Luis, both native soldiers. He left his comrades in the boat, and stripping himself, ran up to the Fort in a state of nudity, and there, with the assistance of Miguel Barbosa and Pedro Manoel, rolled the bodies in quilts, and carried them down to the boat, which transported them to the beach, about a mile and a half to the southward of the town, where they were buried in the sand[**].

The fourth guard was constituted of this man, (Manoel Antonio Alves,) Lorenzo Samed, and Pedro Gonzalves, all native soldiers. The same boat that conveyed them to the Fort, on its return brought Miguel

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[*] There is the greatest difficulty in obtaining anything like accurate information as to periods or dates.

[†] Vide Question 160.

[‡] They had been constantly among the sick, and when the sick left they went over all parts of the house.

[§] There is a slight discrepancy between this evidence and the report of the military commandant, with reference to the dates and the order in which the deaths occurred. By the return of the Commandant, Joao Alexandre Roque died first (on the 20th September), and the corporal on the 21st, the day after Roque. The difference, however, in no way affects the fact.

[‖] Vide Questions 233 to 249.

[¶] Vide Question 239—248. I can only say, when I visited the Fort in April it presented little evidence of having been whitewashed or cleaned in any way.

[**] Vide Questions from 192 to 198.

Barbosa and Pedro Manoel to Porto Sal Rey. The Commandant, however, deemed it advisable not to admit them at once into the barracks, but sent them to a house in the upper and northern end of the town called Beira, which is a part of the District Pao de Varella.

The soldiers of the fourth guard lived in a room next to that in which the sick of the "Eclair" had been*. Manoel Antonio Alves was taken ill in the course of two days, and, strange to say, was at once conveyed to the barracks in Porto Sal Rey. Pedro Gonzalves and Lorenzo Samed were in their turn in the course of ten or twelve days, relieved from duty at the Fort. Gonzalves was taken ill with fever some days† after he returned to the barracks, and died on the 26th November. Lorenzo Samed was also attacked, and recovered after a dangerous illness.

The fifth guard at the Fort, Andre Vass and Jose Sancha, two negro private soldiers, were sent to the Fort to replace the fourth guard. Jose Sancha was attacked with fever three days after he had been there‡; upon which the Commandant resolved for a while to withdraw the guard altogether from that fatal post. Both the soldiers therefore returned to the barracks, where Vass was also taken ill in the course of three days§.

Appearance of the Fever in Porto Sal Rey.

Porto Sal Rey, the port and chief town of Boã Vista, is placed at the northern end of an extensive bay on the western side of the island. The principal part of the town is built upon a flat very little elevated above the sea. At the northern end, the basaltic rock rises about forty feet, and crops out in huge masses in the narrow streets. The soil is a mixture of sand and volcanic débris, over a calcareous sandstone abounding in shells, and overlying large fragments of basalt.

The residences of the members of the Mixed Commission Court, the military barrack and the custom-house, are in the lower part of the town, close to the sea-shore. Behind these the houses are disposed in the form of two wide streets, or rather squares; and the houses, including that of the English Consul, and some of those belonging to the Portuguese, are roomy, and well situated for ventilation.

In the upper portion of the town, which is called *Pao de Varella*, the houses are in general mere hovels, rudely built, much crowded together, and, with few exceptions, dirty. They are occupied by the lowest classes. From the total absence of any police laws, the streets here are also very filthy. A small row of four houses at the northern end of the town, near the sea, is called *Beira;* and to the sea-board frontage of Pao de Varella, there are a few good houses, to which the name of Santa Barbara has been given.

To the north-eastward of the town stands Reshee Hill, which is a mass of basalt, displaying on its northern and southern sides a beautiful columnar structure; and still further northward is Píco Reshee, which is about 900 feet above the sea-level.

The intervening space between the Reshee Hill and the town is a hollow flat, spread over an area of about a mile, with the same soil and subsoil as that in the town. The central part of this area is occupied by a salt-pan, which contains not less than 300 troughs, each a foot deep and about thirty feet square, into which the salt water is poured, there to evaporate and form salt.

During and for some weeks after the rainy season, the whole of this space is more or less inundated.

The cases of Corporal Perez, Justinian da Silva Georgio, Anna Gaspar, and Rosinha San Antao, have already been spoken of; they were all of a comparatively slight nature, and excited no attention even in the immediate neighbourhood where they occurred.

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* Manoel Antonio Alves said they occupied the very room the "Eclair" sick had been in. Vide Question 202.

† Vide Question 263.

‡ Vide Question 277.

§ Vide Question 271.

It will be recollected that Miguel Barbosa and Pedro Manoel, the negro soldiers, were, as a matter of precaution, on their return from the Fort, placed in a house in Pao de Varella, instead of being sent to their quarters in Porto Sal Rey. It is of the greatest importance that every circumstance connected with their stay here, be carefully noted, as it afterwards turned out that the very first case of fever in the town appeared in the room adjoining that in which the soldiers were lodged.

The houses in the Beira Row are divided by rough rouble partitions. The uppermost was occupied by a mulatto native woman of the name of Theresa Maria Jezus; the next by the two soldiers; the next to that by a Portuguese woman, called Anna Gallinha, and a native woman named Anna Texeira; and the other by a Portuguese man called Jose Carlos da Lisboa, a writer.

The soldiers remained at the house in Beira about eight days, and during this time they had many visitors*. They were not laid up; but it is evident that they had the germs of fever in them by the symptoms alone which were manifest while they were there, independent of the fact of their being both soon after attacked with fever†. Both of them declare that they brought nothing from the Fort, except the clothes they had on their backs, and a Portuguese flag.

Their clothes were taken by the wife of Silvester Jose Romess, a negro mason, to be washed‡. Silvester himself had also been a visitor of the soldiers when in the house at Beira; he had never been on board the "Eclair" or at the Fort, but was attacked with fever soon after the soldiers returned to the barracks§, as were also his daughter, niece, and wife, but the latter not until the fever had become general in the town.

Anna Gallinha and Joanna Texeira, who were next-door neighbours to the soldiers, were constantly with them, and the former cooked their victuals‖. Anna Gallinha was attacked with fever in the course of three or four days after the soldiers left Beira, and died with high fever, delirium, and black vomit¶. It is not easy to ascertain dates with precision, but it is probable that this woman was taken ill on the 12th, and died on the 16th October.

A mulatto native called Manoel Affonso, who lived about twenty yards from Anna Gallinha's house, was taken ill with fever about the same time, and died on the 18th October; this man had not been on board the "Eclair," nor on the small island while the crew were there, but he was very strongly suspected of having had a blanket and rug from the "Eclair" in his possession**. By the evidence of John Jamieson he had been a visitor of Anna Gallinha during her illness††, but this was denied to me by the widow of Affonso. Gertrude Bent, a native mulatto woman, who had visited both Anna Gallinha and Manoel Affonso, and lived next door to the latter, was attacked with fever the day after Affonso's death, and died with the same symptoms as Anna Gallinha‡‡.

A man called Antonio Perica, who arrived at Boã Vista from Madeira, a few days after the departure of the "Eclair," and had occasionally seen Manoel Affonso during his illness, and afterwards carried his corpse as well as that of Anna Gallinha to Rabil, for the purpose of burial, was in two days afterwards attacked with fever, which proved fatal in a very few days§§. Eusebio da Luz, who had attended him (Perica) during his illness, was also seized with fever, and soon died‖‖.

Pulcherra Gertrude, the widow of Perica, was also attacked, but she recovered.

Theresa Maria Jezus, who lived the second door from Anna Gallinha

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[*] Vide Questions 284 to 312.
[†] Vide Question 337.
[‡] Vide Questions 245, 307, 317.
[§] Vide Questions 316, 320.
[‖] Vide Questions 232, 244, 343.
[¶] Vide Questions 287, 347.
[**] Vide Questions 289, 407.
[††] Vide Question 289.
[‡‡] Vide Questions 305, 331.
[§§] Vide Question 381.
[‖‖] Vide Question 389.

and Anna Texeira, who had occupied the same room with her, were also at this time laid up with fever, of which they both recovered.

Maria Nazarinha, another visitor of Anna Gallinha, was taken ill, and died during the illness of Anna Texeira.

Jose Carlos de Lisboa, who occupied the other house in Beira, was taken ill some time in the latter part of October, and died in five or six days[*]. Among those who saw him was the son of Senhor Ignacio Carvahal, a merchant in Porto Sal Rey. This young man never had had any connexion with the "Eclair" or any of her people, nor had he seen any sick, except Lisboa, with whom he remained two nights during his illness. He was attacked with fever the day after Lisboa's death, which proved fatal on the 4th of November[†]. Mr. Carvahal was nursed by his mother, sister, and father, who like himself were dark mulatto natives, but not one of them was affected with fever. The father ascribed his immunity to having had an attack of fever with black vomit, in the year 1817, while at St. Domingo in the West Indies[‡].

The disease had attacked several persons in Porto Sal Rey proper, or the lower part of the town, by the end of October; and some of the soldiers were sick in the barracks at this time. The force on the island is in general about forty soldiers, who, with few exceptions, are natives of the Cape de Verds. Before the late invasion of fever, there was one major and commandant, one lieutenant, and forty-one soldiers, including serjeants and corporals. Of the forty-one soldiers, thirty-two were negroes, or very dark mulattoes, and nine were European Portuguese. The whole were attacked with fever, which proved fatal to eight of the nine Europeans; two of them died at the Fort, and the other six in the barracks at Porto Sal Rey[§]. Of the native soldiers three died. Major Mascarenhas, the Commandant, had an attack in December, of which he soon recovered; and the Lieutenant left the island early in November. Lieutenant Santos who came to Boã Vista in November, had a severe attack of fever so late as the beginning of March. His wife and family, amounting to seven persons, were also attacked shortly afterwards; but the disease had by this time in a great measure lost its fatal character, for they all recovered[||].

During the latter half of November and throughout December 1845, and part of January 1846, the disease was at its height in Porto Sal Rey, sometimes six and seven persons dying in one day.

Meanwhile his Excellency the Governor-General with his suite, several of the better class of Portuguese, and the whole of the English with the exception of six persons[¶], had left Boã Vista and taken refuge in San Nicolao, Sal, San Antonio, Brava, and other islands of the group[**]. A rigid quarantine was also imposed upon Boã Vista.

The whole of those who left the island have I believe continued perfectly free from fever, with indeed the very notable exception of one family which returned to it in November.

Mr. Pettingal, the Arbitrator of the Mixed Commission Court at Boã Vista, who left the island on the 22nd October for San Nicolao, returned on the 11th November, under the belief that the disease had nearly if not altogether disappeared.

Mr. Pettingal and his family, consisting of his wife, and daughter a young lady about twenty years of age, were lodged for the first night on their return to Boã Vista, in the house of Mr. Macaulay, and on the following day removed to their own house. A day or two subsequently, two mulatto girls who, during the absence of the family at San Nicolao, had been in charge of the house, were both taken ill with fever; and although one was sent home immediately, the other remained in the house three days after she was attacked, and was during this time frequently visited by Miss Pettingal. Both of the mulatto women recovered; but on the 17th of November, or six days after the return of the family to Boã Vista, Miss Pettingal was seized with symptoms of fever, which in forty-eight hours were unequivocal, being marked by black vomit and retention of urine, and terminated fatally on the afternoon of the 24th November, or the seventh day from being attacked.

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[*] Vide Questions 405, 428, 632.

[†] Vide Questions 425 to 429.

[‡] Vide Questions 432, 433.

[§] Vide Return of Commandant.

[||] Vide Question 506.

[**] Vide Table Nos. 2 and 3.

[¶] Mr. John Rendall, Vice-Consul; Mr. Kenny, Surgeon; Mr. Tait, clerk; Mrs. Learner, housekeeper; John Jamieson, storekeeper; John Dachin, Mr. Macaulay's servant.

Miss Pettingal was sedulously attended during her illness by Mrs. Learner, an English nurse, and constantly visited by her father, mother, and Dr. Kenny, her medical attendant. The captain of an American merchant-ship, who had been at Porto Sal Rey for some weeks, very frequently visited Mr. Pettingal's house during his daughter's illness, and assisted, at least on one occasion, in shifting the bed on which she lay from one room to another. John Dachin, an English servant of Mr. Macaulay, also assisted during Miss Pettingal's illness, and slept one night in the house.

John Dachin was attacked on the 25th November, and died on the fifth day with the most malignant symptoms of yellow fever in the house of Mr. Macaulay. Mrs. Learner must have been attacked almost immediately after Miss Pettingal's death, for she died on the 27th November.

Dr. Kenny was taken ill about the same time, and also died on the 27th, at Rabil.

The American captain had violent vomiting two days after the death of Miss Pettingal, when he was put on board a small vessel and conveyed to the adjacent Island of Sal, with the view of joining his own ship. The authorities there, however, would not allow him to go on board his ship or to land, and he died on his return to Boã Vista, in the same small vessel, just as they were entering the harbour.

The results of the return of this family to Boã Vista had been already sufficiently direful; they were, however, not yet completed.

Two days after the death of his daughter, Mr. Pettingal, with his wife, embarked in a schooner called the "Livramento," and sailed for San Nicolao. During the passage he seemed completely prostrated by mental rather than physical suffering. The vessel arrived at San Nicolao on the following day, and was ordered to perform a quarantine of fifteen days at a desolate part of the island called Tarafal Bay, which greatly aggravated Mr. Pettingal's despondency. He now complained of pain in his legs, which exhibited large dark-coloured patches, acidity at stomach, general pains and yellow suffusion of the eyes; hiccup and black vomit closed the scene on the 5th December.

The "Livramento," immediately after the death of Mr. Pettingal, returned to Boã Vista, and again landed Mrs. Pettingal there. On the passage one sailor died of yellow fever, and another went on shore ill at Porto Sal Rey, where he soon died of the same disease*.

Mrs. Pettingal remained at Boã Vista till the 18th of January, 1846, when she returned to San Nicolao, where (after undergoing quarantine at Sal) she joined the family of Mr. Miller, a merchant.† In the month of February, there were still cases of fever occurring in Porto Sal Rey; but the disease now assumed a milder form. There were a few cases in March, and I saw three so late as early in April. In these there was a saffron-coloured suffusion of the eyes, but no black vomit. Two of them were blacks and the other was a European boy. They all recovered.

By the end of April Porto Sal Rey was quite free from fever.

Rate of Mortality from Fever in Porto Sal Rey.

EUROPEANS.

Portuguese—

Number exposed to fever . . .	53
,, attacked with fever . . .	47
,, died	25

Ratio of deaths in the population, 1 in 2·1
Ratio of deaths in number attacked, 1 in 1·8

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* Vide Question 328.

† I attended this lady during a very severe illness at San Nicolao, in the month of March.

English, including two Americans who were exposed to the fever	11
Number attacked	8
„ died	7

Ratio of deaths in population, 1 in 1·6
Ratio of deaths in number attacked, 1 in 1·1.

French—	
Number exposed to fever	2
„ attacked	2
Spaniards	2 not attacked

Native Population.

Free	666
Slaves	249
Total	915
Died, 65 free, 3 slaves	68

Ratio of deaths in native population, 1 in 13·4

The Fever at Rabil.

Rabil, which lies about four miles to the southward of Porto Sal Rey, is built upon a platform of sandstone, and is elevated about forty-five feet above the sea. It is divided into two districts, Cabeçada and Boaventura. Cabeçada contains 120 small hovels, rudely constructed of sandstone, and much crowded. The people are very poor, earning a livelihood as labourers when there is shipping in the port, carrying water, and cultivating patches in the ravine. Boaventura, or the north-eastern district of Rabil, contains seventy-nine houses; some of them are of a superior kind to those in Cabeçada, being two-storied, and resorted to as country residences by the better class of Portuguese in Porto Sal Rey. The bed of the ravine, which is immediately under the town, on its eastern side, is quite dry at Rabil nine months out of the year. During the rainy season, however, this extensive water-course, rising in the high lands round Estacia, pursuing a north-eastern course, and fed by the numerous rivulets which descend from the mountain-slopes in the neighbourhood, presents here a magnificent sheet of water, nearly a thousand yards broad; sometimes (as in 1844 and 1845) inundating Moradinha, a small hamlet opposite Rabil. About a mile below Rabil, a huge and compact embankment of sand has filled the chasm through which the water flowed to the sea; the consequence is, that part of the water percolates through the sand, and re-appears on the opposite sides of the embankment in little springs, which are eagerly sought for by the peasantry. The rest is left to stagnate on the Rabil side, and as it dries up during the hot weather, little alluvial islets are from time to time exposed, which the people avail themselves of to raise a small crop of corn. Indeed the greater part of the ravine, from Rabil downwards, is in a state of rude cultivation, and contains large green fœtid pools, with all kinds of decomposing matter, the effluvia from which was most offensive when I was there in May 1846.

The men from Rabil who were employed on board the "Eclair," at the coal-heap on the small island, and in the launches, returned to their homes every night. There is, however, no evidence of the fever having in any one instance appeared before the departure of that vessel from Boã Vista; but it is quite clear that one case at least had established itself there before any apprehension of disease had begun at Porto Sal Rey. This, the first Rabil case, although in itself not fatal, was the precursor of a considerable mortality in that town.

Luis Fortes Pathi,[*] whose name occurs first on the list of the labourers on board the "Eclair" from Cabeçada, returned to his house when the vessel sailed, and on the following day went to Moradinha (or Santa Cruz), a hamlet on the south-east side of the Rabil ravine, to attend the feast of the Exaltation of the Holy Cross[†]. This festival is observed on the 14th of September, and its celebration sometimes continues three or four days longer. While engaged in the dance on the third or fourth day of the feast, he was suddenly taken ill, and at once put to bed, where he remained several days[‡]; at the end of this time he was conveyed to his own house in Cabeçada, where he was confined three weeks longer[§]. He had general fever, pain of back, &c., but no black vomit. His daughter, a girl of twelve years of age, was attacked on the tenth or eleventh day after his return to Cabeçada, and died in three days, with suppression of urine and black vomit. Another daughter, seven years old, was next seized, and died in four days; a boy eleven years of age was next taken ill, and died on the fifth day with symptoms similar to those of his sisters. His wife was attacked the same day the boy died; the disease in her case was protracted to fifteen days' duration, and was marked in its last stage as it had been in the cases of her children, by black vomit[‖].

Such was the ominous commencement of the fever in the populous district, Cabeçada.

The next family attacked was that of Manoel Fachina; this man had been employed in one of the launches attending upon the "Eclair." His wife, who had been a good deal in the house of their neighbours the Pathis[¶], was shortly afterwards attacked with fever, as were also his two children, and lastly himself. One of the children died[**] after three days' illness, the others recovered.

Joaquim Pathi, a cousin of Luis Fortes Pathi, who had also been a labourer on board the "Eclair," was attacked shortly after his cousin, whose family he had visited[††]. The fever ran through the family of Joaquim, all of whom recovered. Luis Delgado Nazario, who lived next door to Joaquim Pathi, had fever some time in the latter end of October. He had not been in any way connected with the "Eclair," but had visited the Pathis and Joaquim Marques, the latter of whom had also been a labourer on board the "Eclair," and died of fever on the 29th October, after only a few days' illness[‡‡].

The house of Luis Pathi is situated in the most crowded part of Cabeçada, and adjoining it are the houses of Manoel Fachina, Joaquim Marques, Joaquim Pathi, and Manoel Rosa, who, after Luis Pathi's illness, were the first cases that occurred in Rabil[§§]. The disease soon appeared in the other parts of the town, more especially in the south-western direction.

Boaventura, the north-eastern district of Rabil, was for a considerable time free from fever. The inhabitants there were extremely careful in having as little intercourse as possible with the people of Cabeçada; and their precautions seem to have been so far effectual, for it seems highly probable that there was no case of fever in Boaventura before the 15th of November[‖‖]. On this day, Mr. Antonio da Graça Pinto was brought from Porto Sal Rey, labouring under fever; and very soon afterwards, Rosa Fortes, the servant of Mr. Pettingal, came to her father's house in Boaventura from Porto Sal Rey, also sick. About the same time, or very shortly afterwards, a slave belonging to Cecilia da Britho, who had gone stealthily during the night to Cabeçada, was attacked with fever.

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[*] This man was generally believed to have with Manoel Affonso taken (who died at Porto Sal Rey) some clothes from the "Eclair." He however stoutly denied the accusation, and I could not bring it home to him.

[†] Vide Questions 656, 908.

[‡] Vide Questions 657, 749.

[§] Vide Question 660.

[‖] Vide Questions 665 to 669.

[¶] Vide Question 1253.

[**] Vide Question 1255.

[††] Vide Question 750.

[‡‡] Vide Question 767.

[§§] Vide Question 683, 684, 751.

[‖‖] Luis Santos Nazario states that he was seized some time in the latter end of September. His case was very slight by his own account, and nobody else seems to have heard of it. Antonio da Cruz (966) states that he was attacked he thinks early in November, which could not have been the case, as he adds—after Mr. Pinto was sick, who did not go to Rabil until the 15th November.—Vide Questions 455 to 458, 471 to 475.

M. da Graça Pinto died on the 20th of November; and the whole of the family of Rosa Fortes were taken ill with fever. The slave died after four or five days' illness, in the house of a woman called Ambrosia, who soon afterwards fell a victim to the disease*.

The months of November and December were the most fatal in Cabeçada; and in Boaventura, from the middle of November to January. Some cases appeared in February and March. I saw two as late as the beginning of April, but the disease was then in a mild form.

Rate of Mortality from Fever in Rabil.

Cabeçada—

Free population	558
Slave ditto	7
Total	565
Number of deaths among free population	40
,, ,, slave ,,	1
Total	41

Ratio of deaths in total population, 1 in 13·5.

Boaventura—

Free population	385
Slave ditto	93
Total	478
Deaths among free population	17
,, ,, slave ,,	5
Total	22

Ratio of deaths in total population, 1 in 21·7

Estacia de Baixo.

This small village lies to the east-north-east of Boaventura, and on the opposite side of the ravine which it overlooks. The village is built upon a bare rock of basalt, about a hundred feet above the sea level, and the houses are, with one or two exceptions, small, but not crowded, as in most of the other villages; and from their elevated position are well exposed to the trade breeze. Good water is obtained on the south-east side of the hill. This place suffered least of all on the island, only two deaths having occurred.

The first person attacked was a woman called Felina Rosa, who was taken ill some time in the latter end of November, after returning from Porto Sal Rey. She died after four days' illness. Her brother, Jose Lorenzo, who nursed her, was seized some time in December, and was ill nearly a week, when he died with suppression of urine and black vomit. A great proportion of the people in the village had attacks of various degrees of intensity; but among a population of 256, only three deaths took place.

Moradinha, or *Santa Cruz.*

This small village is also on the side of the ravine, opposite to Rabil, but it is under the cliff, and during the rainy season is occasionally inundated. It was here that Luis Fortes Pathi was first taken ill in the month of September, yet no other case of fever occurred until some time in December†, when a woman called Magdalena Maria Spence came sick from Rabil, and died shortly afterwards. Her brother, Julio Gomes Centento, also died of fever; and a boy called Cæsario Antonio was taken ill, and died in January. These were the whole of the deaths that occurred among a population of 101, about half of whom are said to have been attacked with fever.

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* Vide Question 475.

† Gustavus Fortes Varella, in whose house Luis Pathi was taken ill, says he and his wife were the first attacked. The other part of his evidence, with the exception of calling Rabil "Pao de Varella," quite agrees with the information I obtained at the village; so that there was fever there three weeks after Luis Pathi left the village.—Vide Questions 540 to 550.

Estacia, Povoçao Velha, or *Old Town.*

This small place is about six miles to the south-westward of Rabil, situate at the western side of Platform Hill, near its base. The town is very well supplied with water; the houses are all small, and rather irregularly built, still there is a degree of neatness and cleanliness about the village. From Rabil to Estacia, the road for two miles lies over a bed of sandstone; afterwards the ground is in a great measure covered with boulders and rough fragments of basalt rolled down from Man Mountain and the neighbouring hills. From the sea, which is about two miles distant, sand-hills extend inland nearly one mile.

Of the labourers who were employed on board the "Eclair" and at the coal-heap and in the launches, belonging to this place, two only were amongst the first attacked. Gregorio Tavares, a slave, who had been a good deal on board the "Eclair," had fever in the house of his master (Senhor Nicolao Tavares) about the middle of November*. A man called Nicolao Soares, who had been working at the coal-heap, was attacked somewhere about the same time†.

There is however strong reason to believe that a young man a negro of the name of João Chico Fernandez, and his sister Libania, who came from Rabil sick, were the first persons that had fever in Estacia‡.

A man called Justinian da Britho, came from Porto Sal Rey to Estacia, where he shortly fell ill, and died on the 24th November§. A brother of his, called Fortunato, who had nursed Justinian, was attacked in eight days afterwards, while at Porto Sal Rey, where he died‖. Another brother, of the name of Luis, who had a short time before been at Porto Praya in St. Jago, went to Estacia some time before Justinian's death; he too was taken ill, and died on the 13th of December¶. The whole of the family (amounting to six children) of a man called Simao Antonio, who lived near and had visited Fernandez and his sister, were at this time seized, and swept off by fever**. The disease attacked nearly all in the village. By the end of March it had entirely disappeared.

Rate of Mortality from Fever in Estacia.

Free population	320
Slave ditto	8
Total . .	328
Deaths among free people	24
Ditto ditto slave	0
Total . .	24

Ratio of deaths in the whole population, 1 in 13·7.

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* Vide Question 606.

† Vide Question 1350. Narcisso Soares.

‡ Vide Questions 1070, 1100, 1112, 1115.

§ Vide Question 1101.

‖ Vide Question 1092.

¶ Vide Questions 1098, 1106.

** Vide Question 1119.

The Eastern Villages.

These are three in number, viz., João Gallego, Fundo das Figueiras, and Cabeça dos Tharafes.

João Gallego, the north-westernmost, or that nearest to Porto Sal Rey, is situate in the middle of a large plain, which is covered with sand, volcanic débris, and fragments of basalt. There are hilly ranges on each side of the plain; but the town is well exposed to the trade-breeze, and is only about three miles distant from the sea. Sandstones as well as the volcanic rock are used for building. The houses are small, arranged in rows and little squares, and in some places much crowded. The custom of keeping the window (which is generally on the weather side) closed, renders the hut close and uncomfortably warm. The huts are in general whitewashed, and upon the whole are not dirty. The number of huts in the village is 133. The inhabitants cultivate a little corn, beans, and other vegetables; fish; and occasionally work as labourers in the ships at Porto Sal Rey.

Fundo das Figueiras lies at three-quarters of a mile to the south-east of João Gallego, on a rising ground of sandstone. The volcanic rock is also seen cropping out in the street. There is a chapel here; and the houses are built in the same way as those at João Gallego. The number of houses is 111.

Cabeça dos Tharafes is about half-a-mile to the southward, and a little to the westward from Fundo das Figueiras. This village also stands on a sandy elevation, and contains sixty houses.

This was the first of the three villages in which fever appeared. A young mulatto girl, daughter of a Captain Aniceto, who owns a small sloop, arrived at the village from Porto Sal Rey, where she had been living in the house of Antonio Joaquim Lima, where there was fever, and was herself the next day taken ill. The mother and sisters were in succession attacked; and a woman who lived in the house immediately behind Aniceto's, was about the same time laid up; she had however just come from Rabil. The next person attacked was an old woman called Domingos—she soon died; and on the same day three others died of fever,—viz., Paycan da Britho, Jean Olivera, and Silvesta Agora. The two former had visited the family of Captain Aniceto during their illness. The girl Aniceto and the rest of her family whom I saw and examined minutely, recovered.

João Gallego was in a state of perfect health on the 1st of November, when Pedro Moraes and Ignacio da Cruz Silva, soldiers, came from the barracks in Porto Sal Rey, where the fever was raging, to the houses of their relations in the former town. They were both laid up immediately after they arrived, and in a day or two afterwards the mother of Ignacio da Cruz was attacked with fever and died. Three others of the same family were about this time taken ill, and two of them died. A woman, called Rufina Mends, who lived close to the soldiers, was next attacked, and she also died. Then the family of Nicolo da Silva das Neves, but they all recovered*. From this neighbourhood the disease seemed to radiate in all directions through the town.

Fundo das Figueiras.

One man was said to have been ill with fever at this village in October; but it seems more probable that the first sick person there was a man called João Baptista da Cruz, who came from Rabil about the 19th of November. This man it seems had made a boast that he was proof against fever, and accordingly slept in a bed at Rabil in which two persons had died. When he was attacked at Fundo das Figueiras, Dr. Almeida, who was there, caused him and some others who were sick to be placed in a house by themselves; Dr. Almeida also prevented communication between the villages on each side João Gallego, and Cabeça dos Tharafes, and Fundo das Figueiras*.

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* Vide Questions 476 to 482, 1579.

To whatever cause it was due, there seems no doubt but that in Fundo das Figueiras there was no farther extension of the fever until the middle of December, when a man called Antonio Jose, came to the place from João Gallego, where he had left his sister on her death-bed from fever. He was soon laid up, and the fever from that time spread, as Dr. Almeida thinks, by those who nursed Jose becoming infected. Several families fled from Fundo das Figueiras at the outbreak of the fever, and I believe they all escaped. Of those who remained, upwards of two-thirds had fever. Towards the end of March a few cases remained, but by April there was no fever in the village.

João Gallego was the last resting-place of the fever in Boã Vista. In April I visited there with M. Leao, Surgeon of the second class in the Portuguese Navy, eight cases, of which two proved fatal.

By the end of April, there was no fever on any part of the island.

Rate of Mortality from Fever in the Eastern Villages.

Cabeça das Tharafes—

Free population	386
Slave ditto	23
Total	409
Deaths among free population	31
Ditto slave ditto	2
Total	33

Ratio of deaths in the total population, 1 in 12·4.

Fundo das Figueiras—

Free population	529
Slave ditto	6
Total	535
Deaths among free population	35
Ditto slave ditto	0
Total	35

Ratio of deaths in total population, 1 in 15·3.

Joao Gallego—

Free population	697
Slave ditto	25
Total	722
Deaths among free population	48
Ditto slave ditto	2
Total	50

Ratio of deaths in total population, 1 in 14·4.

Total population of the three villages . . 1666

Ratio of deaths in the aggregate population of the villages, 1 in 14·1.

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* Vide Questions 1574 to 1576.

	Total Resident Population.	Left the Island.	Exposed to Fever.	Died.
Europeans :—				
Portuguese	56	3	53	25
English and Americans	25	14	11	7
French	2	..	2	..
Spaniards	3	..	3	..
Total Europeans	86	17	69	32
Natives :—				
Free 3875	3875	..	3875	266
Slaves 434	434	..	434	13
Total Number*	4309	..	4309	279
Grand Total	4395	17	4378	311

Ratio of Mortality

Amongst Portuguese, Spaniards, and French, who were exposed to the fever . . .	1 in 2·28
„ English and Americans . . .	1 in 1·60
„ Native population—Slaves . . .	1 in 33·4
„ Free . . .	1 in 14·6
Average mortality of native population .	1 in 15·4

Reappearance of the Fever at Moradinha.

On the 30th May it was reported to me by Dr. Leao, surgeon of the second class, that there were some people labouring under suspicious symptoms at Moradinha, the village in which Luis Pathi was taken ill, but in which the mortality had been remarkably small during the prevalence of the epidemic. Accompanied by Dr. Leao and John Jamieson, the Consul's storekeeper, I proceeded to the spot early the following morning, and found two persons, a girl of 14 years of age and a man about 35, with all the symptoms of a most malignant fever.

The countenance of the girl, a dark mulatto, was of a dirty lemon colour, shining through the natural darkness of the skin, made it resemble very much that of a light bronzed statue. A very strong fœter issued from the body, which tainted the room and drove us back from the door until the window was opened. She had complained much of pain along the spine, and still pointed to her head as the seat of pain. She had been bled in the arm by one of the neighbours, and all around the wound was of a greenish colour, swollen, and putrid. In the angles of the mouth there was dark frothy blood. She had had black vomiting; but this symptom had for some hours ceased. The urine was black†, as were also the fœces. The former had been voided in very small quantities. Pulse small, irregular. She had been ill seven or eight days.

The man had nearly the same symptoms, but in a milder degree, and he had not been affected with black vomit.

Being persuaded that the disease had during the epidemic manifested highly infectious qualities, we at once requested Senhor Librao, Adminis-

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[*] To this I think 100 may be safely added. When making the circuit of the island in May, I fell in with little colonies who had fled from Rabil and the northern villages, to the amount of about sixty persons, to avoid the fever.

[†] Circumstances prevented a chemical examination of the urine; but it seemed to owe its colour to the same cause as the matter vomited in black vomit, namely, disorganised blood.

trador do Concelho, to have the sick put into as large a house as the village afforded; to cause a temperature of 140° Fahrenheit to be introduced into all the houses; to have the clothes of two persons who had already died burnt, and to have the village surrounded by soldiery; sending all supplies under proper precaution, and preventing ingress or egress to all except the medical attendants. On our visit to the village early the following morning, the girl was just expiring; but the man was not worse, and was reported to have rallied somewhat during the night. The nausea had in a great measure subsided under the use of small and repeated doses of quinine. The urine gradually became lighter, and increased in quantity; the headache was relieved; he took some nourishment, and was convalescent in five or six days.

There had been two other fatal cases of fever in Moradinha some days before we were aware that the fever existed there. The description of their symptoms leave no doubt of their having died of the fever which had some months before committed such ravages in the other parts of the island. A man died some time in the latter end of May; but as he had laboured under chronic disease for some time, I have not recorded his as a case of fever.

Four other cases occurred between the 1st and 3rd of June. In none of them was there black vomit; they soon passed from the continued to the remittent form, and all recovered under the use of quinine, mild aperients, and nourishing diet.

A girl called Maria dos Prazeres was the first person attacked at Moradinha on this occasion. She had visited João Gallego and the other eastern villages on the 15th of May, and returned to Moradinha where she was laid up with fever on the 20th of the same month. Her mother who slept with her one night after she was taken ill, was also attacked on the 26th and died on the 29th, after three days' illness. The girl whom we saw was called Perpetua. She had visited Maria, soon after which she was seized with fever, and died with the symptoms which have been already described, on the morning of the 1st of June.

The disease did not extend to Rabil or any of the other villages, and on the 13th of June the whole of the remaining patients were convalescent; and when I left the island on the 15th of July last, there had been no case of fever for thirty-three days, and no deaths had occurred since the 1st of June, or during a period of forty-five days.

The following is a Return of the Cases of Fever at Moradinha, between the 20th of May and the 3rd of June, 1846.

Names.	Ages.	Colour.	When attacked.	Result.	Date.
Maria dos Prazeres	15	Dark mulatto	May 20, 1846	Died	May 26, 1846
Rosa Nazario	40	Ditto	„ 26, „	Do.	„ 29, „
Vitoriano Letaó	35	Negro	„ 25, „	Recovered	June 8, „
Perpetua ———	14	Dark mulatto	„ 23, „	Died	„ 1, „
Rosa Fortes	30	Ditto	June 1, „	Recovered	„ 10, „
Mariano da Levamento	..	Ditto	„ 3, „	Do.	„ 11, „
Maria Fortes	..	Ditto	„ 3, „	Do.	„ 12, „
Maria Magdalena	..	Ditto	„ 3, „	Do.	„ 12, „

Up to the period of my leaving the Cape de Verds (on the 15th July, 1846), the disease had in no case extended to any of the other islands of the group, but a rigorous quarantine was still being imposed upon Boã Vista.

I am indebted to Captain Beaufort, hydrographer to the Admiralty, for the most valuable of the instruments with which the annexed observations were taken.

The Barometer was a mountain barometer, made by Newman, which could be read off to the one-thousandth of an inch. The observations are corrected for capacities and temperature; the correction for capillarity has not been made, but as the diameter of the tube is, as I am informed by Mr. Newman, 0·15, the necessary correction is 0·044 additive in every observation.

The Dew-Point was ascertained from the dry and wetted bulb thermometer observations, calculated according to the formula of Dr. Apjohn of Dublin. The thermometers used were two beautiful instruments by Ronketti, marked to half-degree, therefore easily readable to a quarter of degree.

The other thermometers were registers accurately compared, and their errors ascertained by the standard.

Climate of Boã Vista.

As I could not find that any meteorological register had been kept at Boã Vista, the following remarks on its climate are deduced from information obtained from the more intelligent inhabitants of the island; from the generally-observed phenomenon of the trade winds in this quarter; and from tables of observations made by myself three times in the twenty-four hours, which are nearly complete for three months.

On applying to Senhor Lorenzo, the Captain of the Port and a lieutenant in the Portuguese Navy, for information relative to the climate, he sent me the following brief note, which is here correctly translated:—"The constant winds on the Island of Boã Vista are from north to east, generally from north-east, and are most strong from November till May. In August the wind is variable, but ordinarily light, and deviating occasionally a few points from north-east, returning, however, soon to that quarter. In August, September, and October, there is occasional thunder, with the wind from south-east to south-west. When the wind blows from these quarters it is light and lasts only a short time."

This occasional variation in the usual direction and force of the trade wind is quite in accordance with what has been recorded by other observers. Horsburgh gives the position of the inner margin of the north-east trade between longitude 18° and 26° west, which meridians include Boã Vista; and the influence of the fluctuations of the trade wind on the climate of that island may be better understood after looking over the following table, which shows the mean position of its inner limit for each month, together with the extreme variations recorded in the logs which that experienced navigator had access to.

Mean Position.		Extreme Variation.		Mean Position.		Extreme Variation.	
	°	°	°		°	°	°
January,	7 North	5 North to	10 North	July,	12 North..	8½ North to	15 North
February,	7 „	5 „ to	10 „	August,	13 „ ..	11 „ to	15 „
March,	5 „	2½ „ to	8 „	September,	11½ „ ..	9 , to	14 „
April,	6 „	4 „ to	9 „	October,	10 „ ..	7½ „ to	13 „
May,	7 „	5 „ to	10 „	November,	9 „ ..	6 „ to	11 „
June	9 „	7 „ to	13 „	December,	6 „ ..	5 „ to	7 „

From this table it is obvious that the mean place of the inner margin of the trade wind is from July to October inclusive but little removed to the south of Boã Vista; and that the extreme limit to which it extended in a northerly direction varied from 13° to 15°, or almost completely up to the latitude of that island; hence it is clear how the trade from July to October may become very slight, or for a time disappear altogether.

As the sun approaches the northern tropic, the continent of Africa becomes heated to a much greater degree than the sea in the same latitudes. The air over the being continent consequently warmer than that over the sea around it, rises, and colder air flows in from the sea all round to supply its place; hence, during the summer, the winds all along the Gulf of Guinea, and as far westward as Cape Blanco, blow from the south-west, but all more or less on shore. Coming from the sea, these winds are loaded with moisture, and its precipitation causes the heavy rains common on all that coast during the rainy season, which is coincident with these winds. The close approach of the inner margin of the north-east trade winds, and the indraught to the neighbouring continent during July, August, and September, tend necessarily to render the winds about the Cape de Verds, more especially Boã Vista (the easternmost of the group), very variable during these months.

It may therefore be said that, with occasional exceptions during summer and autumn, the north-east trade is the prevailing wind at Boã Vista during the year.

Barometric Observations.—The following are the barometric means for three months.

	9 A. M.	Oscillation from 9 to 3.	3 P. M.	Oscillation from 3 to 9.	9 P. M.
April	29·959	—·065	29·894	+·053	29·947
May	29·993	—·077	29·916	+·070	29·986
June	29·984	—·062	29·922	+·046	29·968

Here the diurnal oscillation is very distinct, and agrees with observations made in this country and elsewhere, in giving a greater oscillation during the two spring months than in June; and also in giving a greater fall from 9 A. M. to 3 P. M. than the rise from 3 P. M. to 9 P. M.

Temperature and Humidity.

In deducing the following mean temperatures, &c. for each month, the means of the observations at 9 A. M., 3 P. M., and 9 P. M., and the actual mean minimum are taken. This process has given a very close approximation to the mean when applied to other observations, especially to those made at Barbadoes by my friend Mr. Lawson, Staff Surgeon of the First Class, and principal medical officer at Sierra Leone.

	Mean Temperature.	Mean Dew Point.	Difference.	Mean daily range of Temperature.	Mean Temperature of Sea.
April	73·33	66·90	6·43	4·96	75·38
May	72·52	65·71	6·81	5·96	73·41
June	74·73	69·48	5·25	6·11	

From the above, it appears that May was nearly a degree colder than April, and the dew-point in the former month upwards of a degree lower, whilst the actual daily range of temperature was a degree higher. In May the temperature of the sea was 1·97 less than in April—a large quantity, considering that the sun was all this time advancing to the northward. On examining the daily progress of the temperature of the sea, it is found to diminish with much regularity from 76° in the beginning of April, to 73° in the end of May.

The influence of the neighbouring sea on the climate of a small island is well illustrated during April and May; for in April, with the temperature of the sea at 75° 38′, the mean temperature of the month was 73° 83′; dew-point 66° 90′, the mean minimum temperature 72° 27′, and the daily variation of temperature in the air 4° 96′ only. In May, while the temperature of the sea was 73° 41′, notwithstanding the much greater power of the sun, the mean temperature fell to 72° 52′, the dew-point to 65° 71′, the mean minimum to 71° 22′; yet in consequence of the greater power of the sun, the maximum during the day was 77° 18′; while in April it was only 77° 23′, or almost identical. Thus, in consequence of two causes, acting different ways in May, and not to the same extent in April, the diurnal variation in May was 5° 96′, and in April 4° 96′ only.

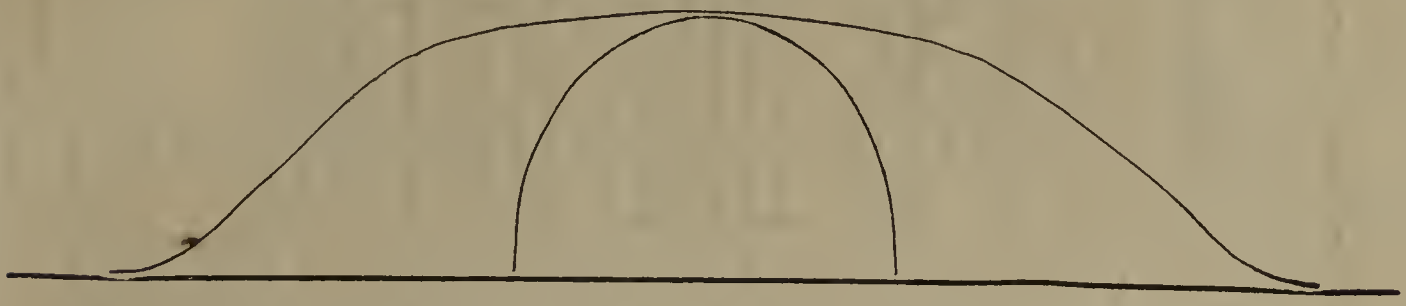
In June there was a considerable advance both of the temperature and dew-point. The daily range of temperature, however, was 6° 11′, or nearly the same as in May. Hence it may be inferred that in June the heating power of the sun on the surface of the sea was more than sufficient to warm the cold water brought from the northward by the currents, for had this not been the case the oscillation in temperature would in all probability have been greater than in May. The mean maxima and minima for three months are:

	April	May.	June.
	°	°	°
Maximum	72·23	77·18	79·45
Minimum	72·27	71 22	73·34
Mean Daily Oscillation ..	4·96	5·96	6·11

In looking at the relative position of Boã Vista and the African coast, it is to be expected that the hygrometric records will show a high dew-point. The north-east wind in passing over the parched lands of Africa, has acquired a great capacity for moisture before it reaches the sea; however, it is still far from being saturated in passing over Boã Vista, as may be seen by a reference to the dew-point column of the tables. Still the proportion of moisture in the air of Boã Vista, although not great under the circumstances, is great compared with other places, as it exceeds that of the West Indies and Bombay during the same season, and is as much as that which was shown by my own observations on the coast of Africa from Sierra Leone to Acra during the wet season in 1841. (Vide Medical History of Niger Expedition, p. 273.)

Some rain falls in July; but the rainy season does not set in fairly until August, and it continues until November. At this period the flats near Porto Sal Rey and other parts of the island are completely inundated; and vegetation is said then to spring up with surprising rapidity. The heat is said to be very oppressive during August, September and October.

Drifting Sands.—These are very remarkable, and occupy a flat hollow space over an area of several miles between the platform under Pico Reshee and the Mountain Range. Some of the sand-hills are thirty feet high, and uniformly present a concave front to leeward, thus:



When the wind is high the sand is drifted about in all directions, and the atmosphere is loaded with sand, most annoying to the traveller by driving in his face, and obliterating all traces of road.

The natives of Boã Vista are in general above the middle size, and well formed; many of them live to a very great age. Besides the occasional occurrence of remittent fever, during and after the rainy season, the people are now and then troubled with diarrhœa, pectoral complaints, and ophthalmia. I saw three cases of cataract. Syphilis in its most disgusting form is very common.

They have a ready and most extraordinary mode of providing wet-nurses on any sudden emergency, or when occasion requires. Any woman who has once borne a child, and is still within the age of child-bearing, is available for this purpose. The details of the process are somewhat long; but the main part of it consists in continued fomentation of the mammæ with a decoction of the leaves of the *jatropha curcas,* and suction of the nipple. I saw the experiment tried most successfully, a copious flow of milk having been produced on the fifth day of the application of the decoction, in a woman who had not nursed, and in whose breasts there had been no milk for twenty months.

Island of Boã Vista, Cape de Verds.—Meteorological Observations.

April 1846.	Days of the Week.	Barometer.			Temperature and Dew Point.						Thermometer.		Merid. temperature of.		Winds.				Clouds, character of.		General Remarks.
		9 A.M.	3 P.M.	9 P.M.	9 A.M.		3 P.M.		9 P.M.						A.M.		P.M.				
		Height in inches.	Height in inches.	Height in inches.	Temp.	Dew Point.	Temp.	Dew Point.	Temp.	Dew Point.	Maximum.	Minimum.	Surface of Sea.	The Atmosphere.	Direction.	Force	Direction.	Force	A.M.	P.M.	
											78·0	74·0	..	..	N.E.	4	N.E.	3	\ —	\ —	Very fine and clear throughout.
4	Saturday..	29·872	..	29·891	74·0	71·0	..	..	..	..	78·5	74·0	..	..	N.E.	3	N.E.	3	\ —	\ —	Do. do.
5	Sunday ..	·915	29·834	·894	73·5	69·0	77·0	69·1	74·0	70·5	..	..	..	..	N.E.	4	N.E.	4	\ —	\ —	Do. do.
6	Monday ..	·882	·794	·872	..	..	..	..	..	..	79·0	74·2	76·5	77·0	N.E.	3	N.E.	3	— —	⌢· —	Fine A.M.; hazy towards evening.
7	Tuesday ..	·882	·794	·872	74·5	69·0	77·5	72·5	74·0	71·0	80·5	74·0	..	..	E.N.E.	2	E.N.E.	3	— —	— —	Hazy over island; objects seen indistinctly.
8	Wednesday	.878	·795	·860	73·5	68·8	77·5	71·6	74·3	69·5	80·0	74·0	78·5	80·0	E.N.E.	3	E.N.E.	3	— —	\ —	Do. do.
9	Thursday .	·921	·820	·910	74·3	70·3	77·5	72·0	74·5	70·8	79·5	73·0	75·5	77·0	N.	4	N.	4	— —	⌢· —	Cloudy A.M.; clear weather P.M.
10	Friday ..	·957	·886	·963	73·5	70·5	76·5	66·8	74·5	70·1	75·0	73·0	76·0	77·0	E.N.E.	5	E.N.E.	5	⌢ —	⌢ —	Cloudy; air filled with sand.
11	Saturday..	·967	·907	·968	72·8	65·6	75·6	68·0	73·5	68·0	75·0	73·0	..	..	N.N.E.	8	N.N.E.	8	— —	— —	Heavy clouds driven to S.S.W.
12	Sunday ..	·978	.	·968	72·4	66·6	..	..	72·0	65·0	75·5	72·5	75·0	76·0	N.	7	N.	7	— —	— —	Continued haze; air still sandy.
13	Monday ..	30·028	·960	30·028	72·3	65·1	75·0	64·5	72·0	65·3	78·0	71·5	76·0	78·0	N.E.	6	N.E.	6	⌢ —	— —	Ditto; sand hills driven about.
14	Tuesday ..	·022	·941	29·992	72·8	67·0	75·0	68·3	72·5	69·0	76·0	72·0	75·0	76·5	N.E.	6	N.E.	6	— —	— —	General haze; air sandy.
15	Wednesday	29.986	·928	·966	73·5	66·6	75·5	67·9	k3·0	68·5	75·5	72·0	75·0	76·5	N.E.	6	N.E.	6	— —	— —	Do. do.
16	Thursday .	·976	·931	·886	72·8	67·5	75·5	67·5	72·5	65·6	76·0	72·0	75·0	76·0	N.E.	3	N.E.	2	\ —	\ —	Fine and clear; clouds P.M. from N.E.
17	Friday ..	30.004	·934	·997	73·0	67·0	75·5	66·5	73·0	67·8	76·0	72·0	75·0	76·0	N.E.	3	N.E.	3	\ —	⌢ —	Do. do.
18	Saturday..	29.966	·903	·964	72·4	66·4	75·0	68·0	72·5	64·9	76·0	72·0	75·5	76·0	N.E.	4	N.E.	4	\ —	\ —	Do. do.
19	Sunday ..	·946	·882	·938	72·5	65·5	75·5	66·5	72·5	65·4	76·0	72·0	75·0	76·0	N.N.E.	5	N.N.E.	5	⌢ —	⌢· —	Cloudy; sand blown to leeward.
20	Monday ..	·942	·894	·932	72·5	64·8	76·0	67·0	72·0	64·3	76·5	72·0	75·0	76·0	N.N.E.	6	N.N.E.	6	⌢ —	⌢ —	Do. do.
21	Tuesday ..	·945	·869	·948	71·5	64·6	75·4	67·8	72·5	65·6	77·5	71·5	75·5	76·0	N.E.	7	N.E.	7	\ —	⌢· —	Clouds from N.E. blown strongly.
22	Wednesday	·966	·889	·958	73·0	67·0	75·0	66·8	71·5	63·0	77·0	71·5	75·0	76·0	N.E.	5	N.E.	4	\ —	\ —	Fine; atmosphere sandy P.M.
23	Thursday .	·951	·924	·905	71·5	63·0	75·0	65·0	71·5	62·0	77·0	71·5	75·5	75·0	N.E.	3	N.E.	3	\ —	\ —	Fine; atmosphere clear throughout.
24	Friday ..	·937	·869	·940	70·5	64·3	74·6	64·9	71·5	66·1	77·0	71·0	75·0	75·0	N.E.	2	N.E.	2	\ —	\ —	Do. do.
25	Saturday..	·999	·928	30·008	71·4	64·6	74·5	63·8	72·0	65·1	77·5	71·5	75·0	75·0	N.E.	2	N.E.	2	\ —	\ —	Do. do.
26	Sunday ..	30·028	·970	·041	72·5	66·4	76·5	67·5	73·0	67·0	78·0	71·0	75·5	75·0	N.E.	3	N.E.	2	\ —	\ —	Do. do.
27	Monday ..	·016	·933	29·970	72·5	68·0	75·5	67·3	72·5	64·9	77·5	69·0	..	..	E.	5	N.E.	3	\ —	\ —	Do. do.
28	Tuesday ..	22·971	·900	·965	73·0	65·3	75·0	64·6	72·5	64·8	77·0	72·0	74·0	75·0	E.	3	E.	5	— —	— —	Atmosphere clouded with sand.
29	Wednesday	·998	·931	·968	72·8	64·5	75·5	65·6	72·0	64·3	77·0	72·0	74·0	76·0	N.E.	4	N.E.	3	\ —	\ —	Fine clear sky.
30	Thursday .	·966	·933	·960	72·0	63·5	75·0	67·5	72·0	65·1	77·0	72·0	..	..	N.E.	4	N.E.	4	\ —	\ —	Ditto A.M.; equatorial cloud current strong P.M.

Island of Boã Vista, Cape de Verds.—Meteorological Observations.

May 1846.	Days of the Week.	Barometer.			Temperature and Dew Point.						Thermometer.		Merid. temperature of		Winds.				Character of Clouds.		General Remarks.
		9 A.M.	3 P.M.	9 P.M.	9 A.M.		3 P.M.		9 P.M.						A.M.		P.M.		A.M.	P.M.	
		Height in inches.	Height in inches.	Height in inches.	Temp.	Dew Point.	Temp.	Dew Point.	Temp.	Dew Point.	Maximum.	Minimum.	Surface of Sea.	The Atmosphere.	Direction.	Force	Direction.	Force			
1	Friday ..	29·972	29·918	29·954	72·5	64·8	75·5	66 5	72·5	65·6	77·5	72·0	74·0	75·0	N.E.	6	N.E.	6	\ —	— —	Fine during forenoon; hazy, P.M., with sand in atmosphere.
2	Saturday..	·964	·879	·978	72·5	69·7	75·5	66·4	71·5	63·7	78·0	71·5	74·0	75·0	E.N.E.	6	E.N.E.	4	⌒ —	— —	Do. cloudy, P.M.
3	Sunday ..	..	·772	·958	..	..	75·0	66·0	72·0	64·2	78·0	71·5	74·0	75·0	N.E.	3	N.E.	3	\ —	— —	Fine and clear throughout.
4	Monday ..	·942	·909	944	72 4	62·0	75·0	66·8	73·0	65 3	78·0	71·0	74·0	76 0	N.E.	3	N.E.	3	⌒ —	\ —	Cloudy, with clouds of sand in air.
5	Tuesday..	·963	·837	·960	73·0	65·3	75·0	67·5	72·5	65·6	78·0	72·0	74·0	75·5	N.E.	3	N.E.	3	\ —	\ —	Fine and clear throughout.
6	Wednesday	30·050	·927	30·075	74·0	66·6	74·5	66·8	71·5	63·7	77·0	71·5	74·0	76·0	N.E.	4	N.E.	4	⌒ —	⌒ —	Rather cloudy, but fine.
7	Thursday .	·083	·950	·083	74·0	66·4	75·7	65·3	71·5	63·8	77·0	72·0	73·5	75·0	N.N.E.	8	N.E.	8	⌒ —	\ —	Blowing hard; air sandy.
8	Friday ..	·079	·972	·007	71·8	66·0	75·5	69·5	71·5	66·0	77·0	71·5	74·0	75·0	E.N.E.	7	E.NE.	7	\ —	⌒ —	Do. do.
9	Saturday..	·026	·990	·055	73·5	67·5	75·5	65·1	71·5	66·1	78·0	71·5	74·5	76·0	N.E.	4	N.E.	4	\ —	\ —	Fine throughout.
10	Sunday ..	..	..	29·981	..	..	..	..	71·0	66·0	..	..	..	..	..	..	..	..	..	..	Do.
11	Monday ..	29·958	·900	·938	71·5	66·8	74·5	69·3	70·5	63·5	76·5	68·0	..	..	..	..	..	..	..	..	Cloudy; air full of sand; sand-hills moved about.
12	Tuesday ..	·958	·910	·998	72·3	64·6	74·5	65·8	71·5	63·0	77·0	70·0	73·0	74·5	..	..	..	..	\ —	\ —	Fine; beautiful cirri P.M.
13	Wednesday																				
14	Thursday .																				
15	Friday ..																				
16	Saturday..																				
17	Sunday ..	30·009	·966	30·017	72·6	64·6	75·0	66·8	72·0	64·3	77·5	71·5	73·0	75·0	N.E.	3	N.E.	3	⌒ —	\ —	Fine throughout; beautiful cirri in the equatorial cloud current.
18	Monday ..	·009	·930	·018	72·5	64·0	74·5	67 0	71·0	64·8	77·0	72·0	73·0	75·0	N.E.	5	N.E.	5	⌒ —	⌒ —	Fine throughout; cloudy P.M.
19	Tuesday..	·001	·955	·001	72·0	65·9	74·0	68·0	70·5	63·5	77·0	71·5	73·0	75·5	N.E.	6	N.E.	6	\ —	⌒ —	Do.
20	Wednesday	011	·948	29·981	72·0	64·3	75·0	67·5	70·5	63·5	77·0	71·0	73 0	75·0	N.E.	6	N.E.	6	\ —	\ —	Do.
21	Thursday .	29·985	·955	·963	72·0	65·9	73·0	65·3	71 0	64 8	77 5	71 0	72 0	75 0	E.N.E.	5	E.N.E.	5	\ —	\ —	Do.
22	Friday ..	·968	·897	·973	71·5	66·1	73·0	66·2	71 0	64 0	77 0	71 0	73 0	75 5	N.E.	4	N.E.	4	\ —	⌒ —	Fine, A.M.; cloudy evening.
23	Saturday..	·984	·902	·981	72·5	64·8	73·5	65·9	71 0	67 2	76 5	71 0	73 0	75 0	N.E.	2	N.E.	1	\ —	\ —	Fine and clear throughout.
24	Sunday ..	..	..	·980	..	..	..	..	..	..	..	..	..	..	N.E.	1	N.E.	1	\ —	\ —	Do. do.
25	Monday ..	·976	·934	·971	71·5	65·4	73·5	65·8	71·5	65·5	77·0	71·0	..	..	N.E.	3	N.E.	3	\ —	\ —	Fine, A.M.; rather hazy, P.M.
26	Tuesday..	·952	·889	·928	71 5	65·5	74·5	63·2	71·0	65·0	77·0	71·0	..	..	N.E.	2	N.E.	2	\ —	\ —	Beautifully clear; Sal very distinct.
27	Wednesday	·951	·905	·936	71·5	64·6	75·0	65·9	70·5	61·8	78·0	71·0	..	..	N.E.	3	N.E.	3	\ —	⌒ —	Do. do.
28	Thursday .	·970	·920	·972	73·0	66·1	76·0	68·0	72·0	66·0	78·5	71·0	..	..	N.E.	2	N.E.	2	\ —	\ —	Do. do.
29	Friday ..	30·004	·954	·999	73·5	69·0	75·5	68·3	72·0	65·9	78·0	72·0	..	..	N.E.	4	E.N.E.	4	⌒ —	\ —	Hazy, with sandy atmosphere.
30	Saturday..	·024	·960	·975	74·0	71·9	76·0	70·9	72·5	68·8	79·5	73·0	..	..	N.E.	5	E.N.E.	6	⌒ —	— —	Do. do.
31	Sunday ..	..	..	..	..	..	..	..	..	..	..	..	..	..	E.N.E.						

Island of Boã Vista, in the Cape de Verds.—Meteorological Observations.

June 1846.	Days of the Week.	Barometer.			Temperature and Dew Point.						Thermometer.		Merid. temperature of		Winds.				Clouds, character of.		General Remarks.
		9 A.M.	3 P.M.	9 P.M.	9 A.M.		3 P.M.		9 P.M.						A.M.		P.M.				
		Height in inches.	Height in inches.	Height in inches.	Temp.	Dew Point.	Temp.	Dew Point.	Temp.	Dew Point.	Maximum.	Minimum.	Surface of Sea.	The Atmosphere.	Direction.	Force	Direction.	Force	A.M.	P.M.	
1	Monday . .	29·928	29·861	29·923	74·5	70·1	77·5	71·8	72·0	69·0	80·0	73·0			E.N.E.	3	E.N.E.	3	— —	⌒ —	Haze; cloudy in the evening.
2	Tuesday . .	·981	·891	·963	75·0	71·3	77·0	72·0	73·0	68·5	80·0	72·5			N.E.	3	N.E.	3	\ —	— —	Haze A.M.; P.M. clear; cloudy evening.
3	Wednesday	·972	·919	·942	73·5	69·8	77·0	71·9	72·0	68·4	79·0	73·0			N.E.	4	N.E.	4	— —	\ —	Ditto; clear and fine P.M.
4	Thursday .	·991	·909	·953	73·5	69·0	76·0	70·9	72·0	67·5	79·0	73·0			E.N.E.	4	E.N.E.	4	— —	\ —	Ditto; clouds disposed in various strata.
5	Friday. . . .	. .	·877	·938	. .	. .	77·0	68·8	72·5	68·0	78·5	73·0			N.E.	3	N.E.	4	\ —	— —	Clear A.M.; hazy P.M.
6	Saturday .	·947	·879	·935	75·0	69·1	75·5	69·6	72·0	67·5	78·5	73·0			E.N.E.	3	E.N.E.	3	— —	— —	Haze throughout.
7	Sunday . .	·997	·935	·975	75·0	·0	77·0	71·1	73·0	68·5	79·5	74·0			N.E.	3	N.N.E.	3	\ —	\ —	Fine and clear throughout.
8	Monday . .	30·009	·935	·973	75·0	69 1	78·0	70·5	73·0	68·5	79·5	73·5			N.E.	2	N.E.	1	\ —	\ —	Do. do.
9	Tuesday . .	29·989	·942	·975	75·0	70·8	78·5	71·5	73·0	69·0	80·0	73 5			N.E.	2	N.E.	2	— —	\ —	Do. do.
10	Wednesday	·971	·889	·935	76·0	70·8	78·5	69·9	73·5	68·5	81·0	73·0			N.E.	3	N.E.	4	— —	— —	Haze A.M.; clear P.M.
11	Thursday .	·955	·921	30·004	76·5	71·5	79·0	72·5	74·0	69·0	81·0	74·0			N.E.	4	N.E.	4	— —	\ —	Do. do.
12	Friday. . . .	30·020	·962	·012	76·0	70·0	78·0	71·5	73·0	68·5	80·5	74·0			N.E.	3	N.E.	3	⌒ —	⌒ —	Do. do.
13	Saturday. .	·014	·970	·012	74·5	67·8	78·5	71·0	73·0	68·5	78·5	74·0			N.E.	4	N.E.	2	— —	⌒ —	Cloudy; sun obscured.
14	Sunday . .	·034	·965	·006	76·0	68·6	79·0	68·3	73·5	68·0	78·5	74·0			N.E.	4	N.E.	4	— —	⌒ \ —	Ditto; P.M. beautiful cirri.
15	Monday . .	·046	·996		74·0	65·5	77·0	68·1	73·0	67·0	79·0	73·0			N.E.	4	N.E.	5	— —	⌒ —	Hazy A.M.; heavy clouds P.M.; rollers heavy over the reefs.
16	Tuesday . .																				
17	Wednesday	29·975	·903	29·950	74·0	67·2	77·0	68·9	72·0	67·0	79·0	72·0			NEbyE	8	NEbyE	9	— —	— —	Hazy; rollers heavy; blowing hard.
18	Thursday .	·992	·925	·973	74·0	68·0	77·0	69·6	72·0	68·0	79·0	73·0			N.E.	9	N.E.	9	— —	— —	Do. do.
19	Friday. . . .	·986	·941	·983	74·5	67·3	77·0	69·8	73·0	69·5	79·0	73·0			N.E.	4	N.E.	4	— —	— \ —	Hazy A.M.; P.M. fine and clear.
20	Saturday. .	·973	·924	·963	74·5	68·5	77·5	69·0	72·5	67·1	79·5	74·0			N.E.	4	N.E.	3	\ —	— —	Fine A.M.; hazy P.M.
21	Sunday . .	·958	·876	·923	76·0	68·9	77·5	69·1	73·0	69·0	79·5	73·5			N.E.	5	N.E.	5	— —	⌒ —	Haze; heavy clouds in evening.
22	Monday . .	·963	·895	·943	74·5	69·4	77·5	69·5	72·0	68·0	80·0	73·5			N.E.	4	N.E.	6	— —	⌒ —	Ditto, with sand in atmosphere; a few drops of rain.
23	Tuesday . .	·960	·900	·973	75·0	69·1	78·5	71·2	74·0	69·0	80·0	73·5			N.E.	4	N.E.	3	— —	\ —	Fine.
24	Wednesday	·970	·879	·933	75·5	70·1	78·5	71·3	. .	. .	81·0	74·0			N.E.	4	N.E.	5	\ —	— —	
25	Thursday .														N.E.		N.E.				
26	Friday. . . .														N.E.		N.E.				
27	Saturday. .	·978	·892	·930	76·0	70·4	78·0	71·3	. .	. .	81·0	74·5			N.E.	3	N.E.	3	\ —	\ —	Fine throughout.
28	Sunday . .	·950	·902	·940	76·0	70·0	78·0	71·3	. .	. .	81·5	74·0			N.E.	4	N.E.	4	\ —	— —	Ditto A.M.; evening cloudy.
29	Monday . .	·998	·994	30·033	79·0	73·5	79·5	72·3	75·0	70·0	81·0	74·0			N.E.	4	E.	8	— —	⌒ —	Wind shifted 3 P.M.; heavy clouds at E.
30	Tuesday . .	30·035	30·002	·067	78·0	72·0	78·5	72·8	. .	. .	81·5	74·0			E.	9	N.E.	10	—	— —	Haze; atmosphere sandy; blowing very hard.

Island of Boã Vista, Cape de Verds.—Meteorological Observations.

July 1846.	Days of the Week.	Barometer.						Temperature and Dew Point.						Thermometer.		Merid. temperature of		Winds.				Clouds, character of.		Remarks.
		9 A.M.		3 P.M.		9 P.M.		9 A.M.		3 P.M.		9 P.M.						A.M.		P.M.				
		Height.	Temp. of Merc.	Height.	Temp. of Merc.	Height.	Temp. of Merc.	Temp.	Dew Point.	Temp.	Dew Point.	Temp.	Dew Point.	Maximum.	Minumum.	Surface of Sea.	The Atmosphere.	Direction.	Force	Direction.	Force	A.M.	P.M.	
1	Wednesday	29·970	77·0	30·032	77·0	29·940	77·0	75·5	69·5	77·0	68·9	75·0	68·3	80·0	74·0	..	..	N.E.	9	N.N.E.	9	— —	? —	Hazy with sand A.M. cloudy P.M.
2	Thursday	·954	77·0	·901	80·0	·933	76·0	75·0	66·6	75·5	70·2	75·0	69·8	79·5	74·5	..	..	N.E.	5	N.E.	5	— —	— —	Ditto.
3	Friday ..	·927	78·0	·926	80·0	·973	76·0	75·5	68·0	76·0	69·2	75·0	70·0	80·0	74·0	..	..	N.E.	3	N.E.	3	— —	— —	Ditto.
4	Saturday..																							
5	Sunday ..																							
6	Monday ..																							
7	Tuesday ..																							
8	Wednesday																							
9	Thursday	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Showers on the 9th preceded by lightning
10	Friday ..																							
11	Saturday..																							

Concluding Remarks.

Having concluded the foregoing narrative relative to the fever which has lately prevailed at Boã Vista, it now remains for me to make such observations as have been suggested, after a careful and impartial consideration of all the circumstances that were brought under my notice; and as a main object of the present investigation is to ascertain whether the disease which visited Boã Vista was of indigenous origin, or was introduced into that island, it is necessary to determine—

The nature of the disease that affected the crew of Her Majesty's ship "Eclair," before their arrival at Boã Vista, and after they were landed at the Fort on the small island there.

Whether the disease of which the Portuguese soldiers died at the Fort, and that which afterwards appeared on the Island of Boã Vista, were identical in nature with that which prevailed among the crew of the "Eclair?"

Whether there be on the Island of Boã Vista, or on the small island in the harbour, evident physical cause to produce a disease such as that which prevailed there during the latter months of 1845, and the months of January, February, March, and April, 1846?

The state of health on the island when Her Majesty's ship "Eclair" arrived there?

Whether the history of the late invasion of fever at Boã Vista affords evidence that the disease was possessed of contagious or infectious qualities?

Under ordinary circumstances, the fever which attacks ships' crews on the African coast is the common bilious remittent. Seldom if ever has it happened that a disease characterized by black vomit has at once broken out in a ship. This malignant symptom rarely occurs, even on shore, except during some of the more severe epidemic visitations. Judging, therefore, from the result of general experience, as well as from the medical reports, it seems to me to admit of no doubt that the disease which invaded the "Eclair" in the latter end of May and early part of June 1845, was the usual endemic fever of the African coast, which although a most fatal disease, is not considered to be of an infectious or contagious nature. The mental despondency which seems to have pervaded the crew rendered them indeed peculiarly susceptible of disease, not only while on detached service in the boats up the river, but also on board the ship (around which the commonly recognized causes of fever were in great abundance), and on this account it is probable that the fever was of a more aggravated type than usual.

At Sierra Leone, the irksome and unwholesome duty of cleaning the hold of the "Albert," as well as that of their own vessel; the unwonted exposure in some cases by day and night; the irregularities committed by men who had for some months been exposed to morbific influences*; all combined to the development of a fever of a much more malignant nature than the usual endemic of the African rivers.

Accordingly, several of the cases that occurred after the ship left Sierra Leone were marked by unequivocal black vomit†—a symptom, as has been already mentioned, extremely rare in the endemic fever, and regarded by all who have served in hot climates, as a test of unusual malignancy.

It is thus quite evident that the type of the fever changed materially for the worse during the passage from Sierra Leone to the Gambia and Boã Vista. There is also great reason to believe that it acquired still greater virulence while the crew were at the Fort. The house in which the sick were lodged there contains only one room at all well ventilated; and, judging from the evidence of Dr. Almeida, they must have been much crowded*; at all events, the fact is beyond doubt, that the accession to the sick list and the mortality became much greater at this than they had been at any previous period. In short, from the endemic remittent of the African coast, the disease had, from a series of causes, been exalted to a concentrated remittent, or yellow fever†.

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* Vide letter of Sir Wm. Burnett to Viscount Canning, Under Secretary of State, &c.

† Vide Dr. Stewart's Report. Page 87. "Correspondence on subject of the Eclair," &c., presented to Parliament in 1846.

The European soldiers who were attacked with fever so soon after the departure of the "Eclair," had arrived from Portugal in August 1844, and had been performing the usual military duties of the island, which are by no means of a laborious nature. They had never been on board the "Eclair." To state with great precision what their symptoms were is not in my power, for they were not seen by a medical man until in *articulo mortis.* The account, however, of their negro comrades, although brief, emphatically shows that the disease of which they died was an intensely malignant fever. They had general fever, delirium, and at last black vomit‡.

The same description belongs to the fever that afterwards broke out on the Island of Boã Vista. Dr. Almeida, who was present during the early period of the epidemic, and Messrs. Moraes and Leao, surgeons in the Portuguese Navy, who arrived in February, informed me that in the majority of the cases there were yellowness of skin, suppression of urine, and black vomit. The two former symptoms existed in the cases I saw at João Gallego in April, but there was no black vomit. Suppression of urine was so common a symptom, that it has been mentioned to me by all classes with whom I spoke on the subject of the fever. It is worthy of remark that according to Louis, this was an extremely rare symptom in the epidemic at Gibraltar in 1828§. It seems then hardly to admit of a doubt that the disease with which the crew of the "Eclair" were afflicted, that which proved fatal to the European soldiers at the Fort, and that which soon afterwards prevailed on the Island of Boã Vista, were identical.

I have already endeavoured to account for the malignant character assumed by the fever among the people of the "Eclair;" but it still remains to be shown how the soldiers, natives, and other inhabitants of Boã Vista, became affected with a similar disorder.

In the present state of our knowledge regarding the telluric origin of disease in warm climates, it is hard to say what kind of soil may not generate fever‖, but the position of the Fort on a bare basaltic rock, the dry calcareous surface of the small island generally, its extreme aridity and free exposure to the trade breeze, would lead one to suppose that fever was at all events not likely to originate there. But the soldiers had only a week before they were seized with fever, come from Porto Sal Rey, where, at least in a theoretic view, the condition of the soil during and after the rainy season is such as may cause fever.

Assuredly many bad fevers have been attributed to less obvious causes. At Rabil, which is rather less than four miles distant, the existence of a cause is not only theoretically but practically apparent. In the neighbourhood of the Ravine there remittent fever does occasionally affect the residents, and has, during some seasons, assumed a severe and fatal form as in 1821-22, 1827 and 1833¶.

Now if the fever that raged among the "Eclair's" crew was primarily the remittent of the African coast, aggravated by circumstances to an unwonted degree of malignancy, it is quite reasonable to believe that a fever of equal intensity might be grafted on an endemic of the same nature originating on the Island of Boã Vista, whose geographical position is within the legitimate domain of yellow fever.

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* Vide Questions 1559, 1560.

† This assumption is, I am aware, opposed to some high authorities; but it is made on a calm review of the facts of the cases before me, which seem to favour the views of those who consider a common remittent convertible into yellow fever.

‡ Vide Questions 221, 236.

§ Vide "Researches on Yellow Fever," by P. Ch. A. Louis, translated by Shattuck, page 240.

‖ The late Dr. Fergusson, who paid more attention to the causes of fever than most men of his day, says "that sandy soils should in malarious climates prove as productive of aggravated remittent as the swamp, has never been sufficiently explained. Certain it is, however, that they do so, in a marked and prominent degree. The Alemtejo and Algarves of Portugal—regions, I may say, altogether of sand—are the most prolific of fever of any in the Peninsula."—Vide "Edinburgh Medical and Surgical Journal," No. 155, page 298.

¶ Vide Questions 436 to 442, 550, 551, 1549 to 1553.

If then the existence of a practically efficient, as well as of a probable cause of fever on the island be admitted, it now only remains to be seen whether there is reason to suppose that either was in operation at the period in question, for if such were the case, the arrival and stay of the "Eclair" at Boã Vista with fever among her crew, and the almost contemporaneous occurrence of a similar disease on that island, can only be regarded as mere coincident events.

If on the other hand it does not appear that any local cause of disease was at this time in action, either on the small island or on Boã Vista itself, and if the subsequent history of the fever proves it to have been capable of propagating itself, then I think that under all the circumstances there will be strong grounds for concluding that the visit of the "Eclair" and the invasion of Boã Vista by fever stand in the relation of cause and effect.

While the "Eclair" was at Boã Vista there was occasional rain, and the thermometer ranged from 80° to 84°[*]; it does not however appear that the flat behind Porto Sal Rey was inundated until after fever broke out in the town[†]. Dr. Almeida, while he admits that remittent fever occurs in some seasons at Rabil, declares that he never knew it to originate at Porto Sal Rey; and his experience extends over thirty-seven years[‡]. The same gentleman asserts that the island was quite healthy until some time after the departure of the "Eclair," and in this he is borne out by all with whom I have communicated on the subject[§].

Mr. Macaulay, to whom I am indebted for much valuable information, says "Boã Vista was free from any kind of sickness prior to the 'Eclair's' arrival, as well as during her stay there, and for a short time after her departure." Again, "Boã Vista is a remarkably healthy place, and fevers there amongst the established residents, or amongst the strangers (by which term I suppose such residents as the British functionaries and their families are referred to), are almost, if not altogether, unknown. My personal experience extends back only to the beginning of February 1844, but since that date, neither in the family of the British Arbitrator, which consisted of five English persons, nor in the family of the British Consul, which consisted of eight English persons, nor in my family, which consisted of six English persons, nor amongst the other English residents did one single case of fever occur, prior to the appearance of the disease which has lately committed such fearful ravages. The instance of the Consul's family is a very strong one; for they have lived in the island during the last seven years, without suffering in the smallest degree from the climate."

After most minute and repeated investigation at Porto Sal Rey, at Rabil, Estacia, as well as the eastern villages, I have failed to discover that there was disease of any kind on the island, until after the arrival of the "Eclair." If to testimony such as this be added the fact that Moradinha, which is situated in the Rabil Ravine, and Estacia de Baixo, which overlooks it (both of which places have always come in for a great share of remittent fever, at any time that disease was prevalent), were in a most unaccountable degree exempt from fever during the late epidemic[‖], then I think that the source of the disease is not to be found on the island, and therefore is to be looked for among the sick crew of the "Eclair."

The previous healthy state of Boã Vista will I think not now be questioned, nor will the occurrence of the disease in the two European soldiers at the Fort soon after the departure of the "Eclair's" people. If then the absence of all local cause on the small island, and the identity of the diseases that proved fatal to them and to the sailors be admitted, the inevitable conclusion is, that the fever was propagated to the soldiers, either directly by contagion from the bodies of the sailors or by an infectious matter left in the room which had been occupied by the sick crew. The same reasoning applies to the Island of Boã Vista, to which it seems beyond any doubt that the fever was conveyed by the negro soldiers, and by them transmitted to Anna Gallinha and their other visitors at Pao de Varella.

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[*] Vide Dr. Stewart's Report. The observations were made by Dr. Carter, of Her Majesty's ship "Growler."

[†] Mr. Macaulay informed me that there was a good deal of stagnant water behind the town at this time. I never saw the centre of the flat perfectly dry even in the dry season.

[‡] Vide Questions 435, 1544, 1545, 1543, 1557.

[§] Vide Question 442.

[‖] Vide Question 548.

The disease was for some time confined to the visitors of the negro soldiers, or the immediate neighbourhood where they lodged; and it is remarkable that Anna Gallinha and Lisboa the writer, the only two Europeans in the same row, both died. From Pao de Varella the fever can be traced to the lower part of Porto Sal Rey, eventually including nearly the whole of the population that remained in the town.

At Rabil the case was the same as at Porto Sal Rey. Luis Pathi, who had been a labourer on board the "Eclair," (and who was very strongly suspected of having had in his possession a coverlet and blanket from the Fort,) was taken ill at Moradinha, and remained there some days in the house of Gustavus Fortes Varella, who with his wife was attacked with fever three weeks afterwards*. Pathi was carried to his own house in Cabeçada, where there was not a single case of disease of any kind. In a short time† his whole household, consisting of his wife and three children, were attacked, and speedily fell victims to the fever. From this house, as from a central point, the disease spread in all directions, more especially to the south-west and most densely populated part of the village.

When the disease extended to the villages near the eastern and western extremities of the island, and had to traverse miles of uninterrupted waste of sand and rock before reaching a place of destination, its march became still more clearly defined.

At Estacia the origin of the disease was distinctly referrible to the arrival of a young man, called João Chico Fernandez, and his sister, in a sickly state from Rabil, where the fever was raging; from the house in which these two persons were lodged, and from that occupied by a man called Justinian da Silva Britho, who about the same time came from Porto Sal Rey, the fever spread over the whole of the village.

At Cabeça dos Tharafes, Fundo das Figueiras, and João Gallego, the disease could in each case be clearly traced to one or two individuals coming from an infected district, and affecting first the inmates of the house they remained at, next the visitors, and gradually extending over the whole of the inhabitants.

In fact it may be said that in each town and village on the island the disease first appeared in a single house, which became an irradiating focus for its dispersion in all quarters.

The exemption in persons who removed in time from infected places was clearly shown in many instances. Dr. Almeida by changing the residence of his family from place to place, succeeded in keeping the whole of them intact. The same gentleman for some time prevented the introduction of the disease into Fundo das Figueiras, by the establishment of a sanitary cordon; and afterwards retarded its progress by the imperfect means of segregation of the sick which he had in his power. Boaventura was for some weeks without a case of fever, although the disease was raging at Cabeçada, a few hundred yards only from it, by the adoption of measures to prevent intercourse.

When making the circuit of the island in May, I fell in with many families who had fled from the several villages at the outbreak of the fever. At a place called Espinguera, near Mount Broyal, on the north side of the island, there were three families amounting to twenty-four persons, who had left João Gallego early in November, and they had all escaped. At Cantor on the north-east base of Mount Ochello, there were fifteen people from Cabeça dos Tharafes and João Gallego, who had left these places when the fever appeared. The original number that had taken refuge here was twenty-three or twenty-four; but eight persons had imprudently[*] returned to the villages in January; of these all had fever and four died. At a small hamlet only one mile and a half to the eastward of Cabeça dos Tharafes, there were twelve persons[†] from that village who had been completely exempt during the whole of the epidemic, merely by never leaving their place of refuge, and allowing no one from the villages to come near them.

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* Vide Question 543.

† Ten days.

Other instances of complete immunity from seclusion are on record in the evidence appended to this report[‡].

From the above statements it is evident that the fever at Boã Vista possessed the properties which are usually attributed to a contagious disorder; and connecting this fact with the time and circumstances of the seizure of the soldiers at the Fort by fever, and of the appearance of the disease in Porto Sal Rey, will I think leave no doubt of its introduction into the island by the "Eclair."

Of the 87 persons[§] employed on board, in the launches, and at the coal-heap on the island ten died; a rate of mortality not great, but considerably beyond the average rate of death of the native population of the island. Most of the labourers on board went below, and those at the coal-heap had free intercourse with the healthy portion of the crew, who were living, it may be said, with their sick shipmates. Yet in one case only was a labourer connected with the "Eclair," the first person attacked in any of the villages (Luis Fortes Pathi, at Cabeçada), and none of the washerwomen were among the first laid up in Porto Sal Rey. Facts such as these would indicate that the fever only propagated itself to those who approached others under its influence. The case of Pathi just mentioned, forms, however, a marked exception to this, as in his case the medium of infection seems to have been either something in the ship while the sick were on shore, or some of the healthy crew, or possibly the clothes which he is supposed to have obtained surreptitiously from the Fort. He was indeed on board when the sick were brought on board from the island, but so were also nearly the whole of the other labourers.

In other respects the case of Pathi is invested with much interest, from the fact of his having been attacked at Moradinha so early as the 17th of September, and the circumstance scarcely being known beyond the village; his being carried to his own house in (Cabeçada) Rabil, where, after a long but not violent attack he recovered, but lost the whole of his family from fever, and from this house being the nucleus from which the disease spread over Cabeçada.

There was no fever on any of the other islands, except at St. Jago, where there was the common endemic remittent, which prevails there every season during and after the rains[‖]. There was no unusual amount of disease at Sierra Leone, the Gambia, or any other part of the coast visited by the "Eclair." In short there was no malignant fever anywhere on the African coast or among the islands, except in the "Eclair" and at Boã Vista.

In looking at the position of the Cape de Verds upon the chart, they are seen to be situated in the Atlantic Ocean, between the parallels of 14° 20′ and 17° 20′ north latitude, and 22° 20′ and 25° 30′ west longitude to the westward of Cape Verd on the coast of Africa, at distances of from two hundred miles to nearly five hundred miles from it.

Boã Vista is the easternmost island of the group, and consequently that nearest to the coast. *Sal* lies about twenty four miles to the northward of and nearly in the same longitude as Boã Vista.

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[*] The names of those who returned were Maria Silvesta, Vicente Gonzalves, Apolicarpo dos Santos, Luis Luzardo, Urbano da Cruz, Leandro Letaó, Clemente de Barros, Elurio Letaó; the four first named are those who died.

[†] The families of Rosa Lopes and Francisco da Carme, at Agua dos Caballos.

[‡] Vide Questions 518, 520, 534, 984.

[§] Of these five were not attacked; vide 831, 984, 1161, 1221, and 1415. Five persons who left the island were not examined.

[‖] It has been stated that there was yellow fever at San Jago while the "Eclair" was at Boã Vista. This statement is erroneous. I have met with several gentlemen who were at San Jago at the period in question, and they all assured me that the only fever on the Island of San Jago was at Porto Praya, where the usual endemic remittent prevailed, but in no unusual degree from what is experienced during every rainy season. I allude particularly to information from a resident merchant, Mr. Joao Baptista da Cruz.

The other islands of the archipelago, eight in number, are all to the westward of Boã Vista and Sal, and are disposed in the form of two lines of four islands in each; the one line extending in a northerly and the other in a southerly direction.

To the northward, *San Nicolao* is about sixty miles west from Boã Vista. From San Nicolao, *San Lucia* bears about west by north distant eighteen miles. *San Vincente* is about eight miles further on in the same direction, and *San Antonio*, the northernmost of the group, is only ten miles from the island last mentioned.

To the southward, *Mayo* is about fifty miles from Boã Vista; *St. Jago* is sixteen miles to the westward of Mayo. *Fogo*, or *Fuego*, is thirty miles west-south-west from San Jago. *Brava*, the southernmost of the group, is ten miles to the southward and westward of Fuego.

It is thus evident that all of these islands are within a few hours' sail of each other with the north-eastern trade, which blows in this quarter with little variation throughout the year. Now had the disease depended upon general vitiation of the atmosphere over the Cape de Verds, why did Sal, San Nicolao, San Antonio and the other islands escape, while the pestilence was spreading far and wide upon the devoted Boã Vista? The supposition (if there be such) that there was an unwholsome condition of the air over the islands and corresponding portion of the African coast cannot be reasonably entertained; for it is not in the usual order of nature that a cause so generally diffused would produce an effect so merely local. An attempt has been made in a former part of this report to show that the origin of the fever on the Island of Boã Vista was not attributable to an indigenous cause, but that it was the result of the visit of the "Eclair."

I found it quite impossible to ascertain with any degree of correctness, the number of persons attacked in the several villages; but from the best information I could obtain, about two-thirds of the whole population of the island were affected by the fever. The fatal cases terminated generally with the same symptoms as those presented by Perpetua, the girl who died on the 1st of June at Moradinha. Remittent and intermittent were much less common among the convalescent whom I saw on my first arrival than I had expected; but they were generally very weak, and benefited much by quinine. This state of debility was I believe greatly owing to the famine under which the people had for some months been labouring; a circumstance which doubtless not only retarded convalescence in a great many cases, but in all probability considerably added to the rate of mortality*. A very marked improvement followed the distribution of the bountiful supplies of provisions brought by Commodore Jones in Her Majesty's ship "Penelope," and the other generous and liberal donations of corn sent from Sierra Leone and the Gambia.

Of second attacks I could only find five cases at all clearly established; from the little appreciation that the people have of time, it is not possible to arrive at the exact intervals between the attacks; their statements, however, may be seen among the examinations†.

With regard to the protective power of a first attack against a second, it is proper to mention that the natives (not naturally brave) had no hesitation, after having passed through the fever, to enter freely the houses of the sick, and that a Spanish carpenter (Andrea Gannia) and a cigar-maker (called Jose Pedro Pons), who had both had fever with black vomit, in the Havana, visited with impunity nearly every sick person in Porto Sal Rey, and also assisted in sewing the dead bodies up in sheets. Senhor Carvahal also attributed his immunity from fever while he was attending his son on his death-bed, to having had the disease at St. Domingo in 1817‡.

When speaking of the mortality from the fever, I omitted to mention that the people were for a considerable time without any medical assistance whatever. Dr. Almeida went from Porto Sal Rey to the country on the 19th of November. Dr. Kenny died on the 27th of November. The surgeon of the Governor-General left the island with his Excellency on the 1st of December, and Messrs. Moraes and Leao, surgeons in the Portuguese Navy, did not arrive from Lisbon until the middle of February 1846.

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* The mortality occurred chiefly among those of from twelve to thirty-five years of age, and death took place generally between the third and seventh days.

† Vide Questions 372, 793, 1282, 1338.

‡ Vide Question 433.

The treatment adopted by the Portuguese surgeons, including Dr. Almeida, the resident medical man on the island, was of the most simple kind. They rarely bled generally, sometimes cupped and blistered, administered diaphoretics and anti-spasmodics, and relied chiefly upon quinine and mild purges and enemata. Mercury was not exhibited in any form. As experience has, alas! too generally taught on other occasions, the bad cases were little, if at all, amenable to treatment of any kind; but great dependence was placed upon quinine in checking vomiting, whether bilious or black.

How is the reappearance of the fever at Moradinha to be explained? During the prevalence of the epidemy, there was one case of fever in the village so late as the 24th of March. An out-and-out contagionist would at once answer the question, by saying that the interval between this case and that of Maria dos Prazeres was not sufficiently long to extinguish the activity of the poison. It seems, however, more probable that Maria imbibed the fever poison in one of the houses in the eastern villages, as there were many persons there in a state of convalescence only, early in May, although there was no one there confined to bed from fever later than the end of April. If this explanation be correct, it is the only case, with the exception of that of Luis Pathi, which was brought under my notice as having been communicated without direct intercourse with the sick.

Sir William Pym and those who espouse his doctrines will contend that the fever of the "Eclair" was from the first a contagious disorder, differing essentially from the remittent of the African coast. If a disease such as that described by Sir William Pym be really endemic on the coast, surely we ought to hear more of it, considering the large squadron which is now kept there.

If it be assumed that the fever on board the "Eclair" was the Bulam, and therefore primarily contagious, I would ask where was it contracted? Not at Seabar, for in that case we would expect other vessels that visited that part of the station to be affected with a similar disease. Was it at Sierra Leone? For if so, why were not some of the many Europeans from the numerous shipping there, attacked with a fever manifesting contagious qualities? And we know that while the "Eclair" was there, there was nothing unusual either in the amount or nature of disease in the colony. The same may be said of the Gambia. Assuredly the remittent is quite destructive enough of human life; and in the late Niger Expedition, where its fatal effects were manifested in a terrible degree, there was no reason to believe that its spread was due to contagion. The whole of the surviving sick were landed at Fernando Po, after we got clear of the Niger, yet none of the residents there suffered in consequence, although many officers and men died at Clarence Cove. Why did this malignant disorder rage on board the "Eclair" and not in other vessels that were with her? Simply because her circumstances were peculiar, and it is entirely to this peculiarity and unwonted combination of circumstances that the contagionality of the fever with which her crew was affected is due. To me there is no proof that the fever in question was in any degree contagious before the vessel reached Boã Vista, and we have a right to look for proof both at Sierra Leone and the Gambia, where the evidence is against contagion. At Boã Vista the reverse is the case; for the whole history of the progress of the fever subsequent to the landing of the crew on the small island proves it to have then possessed highly infectious qualities. I would say, then, that the contagious properties which marked the "Eclair" fever at Boã Vista were acquired or contingent, and not primarily or essentially belonging to it.

It is not within my province, in drawing out this report, to follow up the history of the disease on board the "Eclair" in her progress from Boã Vista up to the period of her being paid off in England; but as much has been said regarding the danger of introducing the malady under which the crew laboured into England, I may state that I offered to take charge of the sick, on her arrival at the Motherbank, provided they were removed into a hulk of proper size. Dr. (now Sir John) Richardson had already submitted to the Lords Commissioners of the Admiralty the propriety of having the whole of the sick transported from the "Eclair" to one of the wings of Haslar Hospital "to be appropriated exclusively for them." This humane proposal might in my opinion have been acted upon, without any risk of the public health being endangered; for the history of yellow fever in ultratropical countries shows that a continued high temperature beyond that of the summer heat of England is necessary to keep its poison in a state of activity; and that when it has prevailed at Gibraltar, Cadiz, Malaga, and Leghorn, it has always been preceded by a certain duration of high temperature. The Superintendent-General of Quarantine objected most decidedly to the sick crew being landed at Haslar, on the ground "of the disastrous consequences to the mercantile interest of this country, in the event of the 'Eclair' being admitted to pratique;" for this reason alone, "and without entering into a discussion relative to the public health," did Sir William Pym oppose the removal of the sick crew to Haslar. One would have indeed hardly expected that the Superintendent-General would have much dread of the danger of infection, from the crew of the "Eclair" being landed in the month of October in the commodious, cool, and well-ventilated wards of the finest hospital in the world, after reading in his work that the contagious powers of yellow fever "are destroyed by cold, or even by a free circulation of moderately cool air"*.

The main conclusions, from a review of the whole of the circumstances that were brought under my notice relating to the "Eclair" at Boã Vista, seem to be,—

First, That the fever on board the "Eclair" was primarily the remittent of the African coast, which is not a contagious disorder, but that the disease acquired contagious qualities in virtue of a series of causes.

Second, That although there exists on the Island of Boã Vista a physical cause capable of producing remittent fever, yet it does not appear that that cause was in action when fever broke out in September 1845, and that the island was quite healthy when the "Eclair" arrived there.

Third, That the disease of which the Portuguese soldiers died at the Fort (Duke of Braganza) on the small island, was that which afterwards ravaged Boã Vista, and the same as that which prevailed among the crew of the "Eclair."

Fourth, That the fever was propagated throughout the island almost exclusively by direct intercourse with the sick, there being only two cases in which there appears any probability of persons having been infected in any other way.

Fifth, That although those who had passed through the fever were much less liable to the disease than those who had not, yet it would appear that a person having had one attack, possesses no absolute protection against a second attack.

Sixth, That connecting the whole of the circumstances attending the arrival and stay of the "Eclair" at Boã Vista with those under which the disease appeared on the small island, and afterwards on Boã Vista itself, leaves no doubt of its having been introduced by the "Eclair."

Seventh, That in all probability the mortality from fever on the island was much increased by the want of proper nourishment for the people, as well as by the total absence of medical assistance for some months.

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* Vide "Observations upon the Bulam Fever, &c.," page 2.

Eighth, That the disease had in no case spread to any of the other islands of the Cape de Verd archipelago.

(Signed) J. O. McWILLIAM,
Surgeon, R.N.

Before leaving Boã Vista, the following suggestions were made by me to the Council of the Board of Health there:—

As the fever which has lately prevailed on this island has been proved to have possessed highly infectious properties, and as infectious matter attaches itself frequently for long periods to various substances, more especially to articles of bedding and clothing, particularly if great attention is not paid to cleanliness; it is desirable, with the view of preventing a recurrence of this formidable disease, to enforce some measures of police, in addition to those already adopted under the sanction of the Council of Health.

1st. That all accumulation of filth in the streets be at once removed; and that in future foul water and offal of all kinds be thrown into the sea, instead of being emptied upon the streets.

2nd. That the chief inhabitant of each house, be made responsible for the street in front of it being kept clean.

3rd. That fish be not gutted or cleaned except at the sea-side; or if done in the house, the offal is to be at once thrown into the sea.

4th. That pigs be not allowed in the streets, but kept in proper styes, which it would be advisable to have a little way out of the town.

5th. The practice of digging in the streets for building-stones to be discontinued, as the deep holes left become receptacles for filth of all kinds. The holes in the streets ought to be filled up before the rains commence.

6th. The houses to be whitewashed and thoroughly cleaned at least once a-month; and the bedding and clothing to be well aired at the same time.

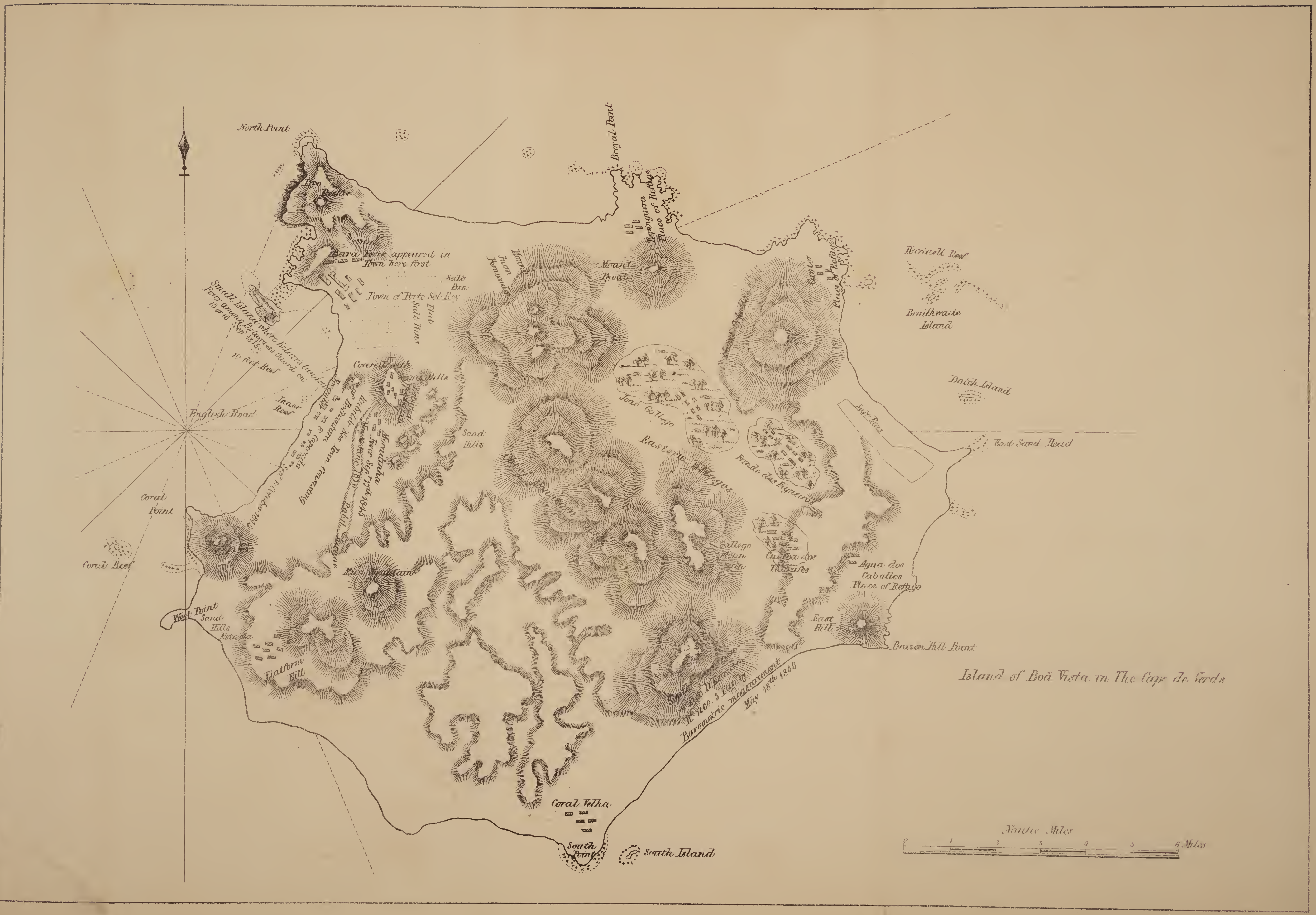
7th. The temperature of 140° Fahrenheit has been maintained in most of the houses for eight or ten hours; they have also been whitewashed, and washed with Burnett's disinfecting solution; but in the event of any outbreak of the sickness, it will be again necessary, in addition to placing the sick in apartments separate from the healthy, to have recourse to the large fires in the house, to thorough cleaning, and the general adoption of the measures that have lately been successfully applied at Moradinha.

The above rules are recommended for the general guidance of the people, but the due performance of them is to be considered a matter of police; and for that purpose the officers of the Administrador do Concelho ought to go the rounds of the towns weekly, and report upon the condition of the houses, as well as superintend the monthly cleaning and whitewashing of houses, airing of bedding, clothing, &c.

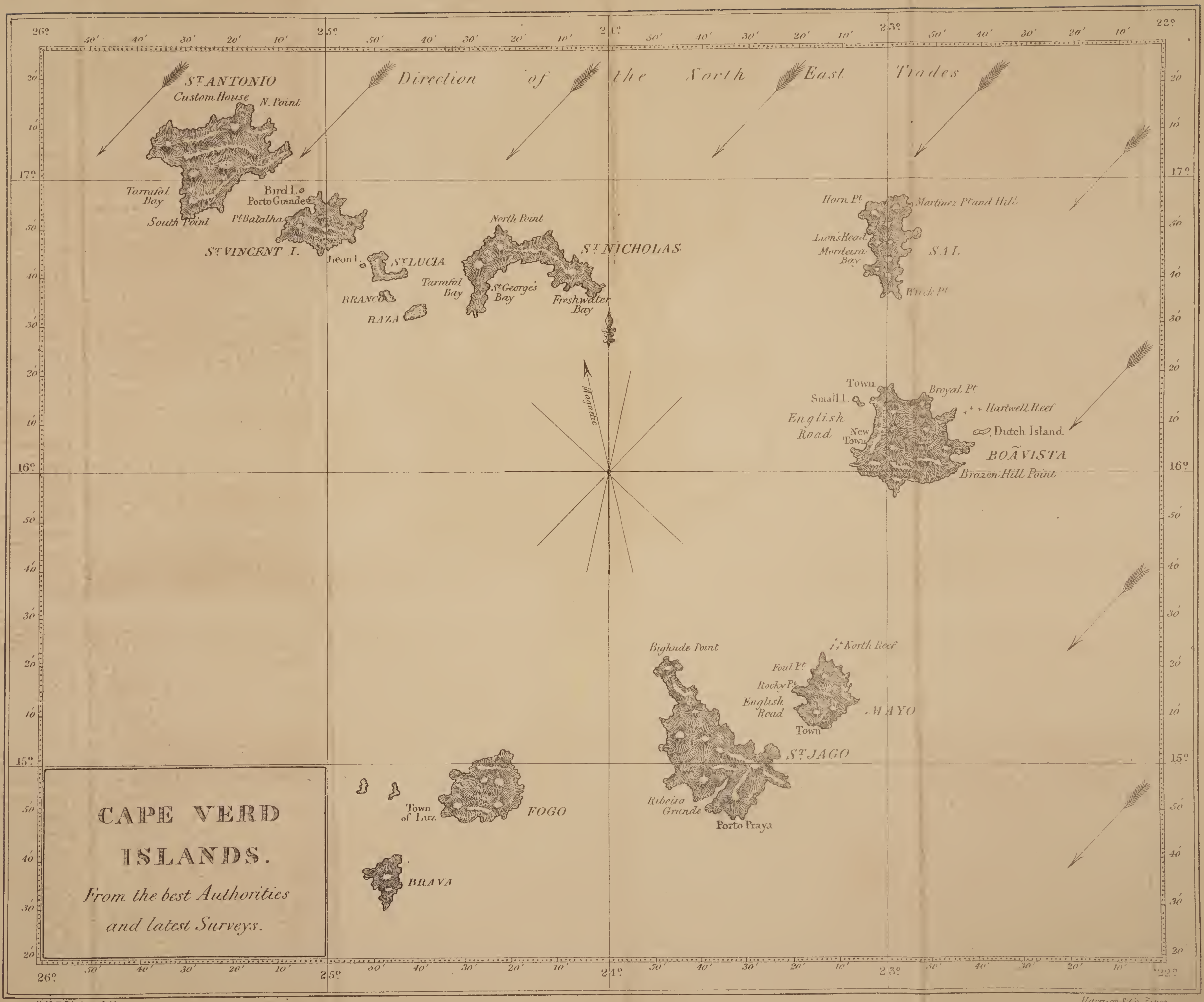
The means of enforcing any or all of the above measures as may meet the approbation of the Council of the Board of Health, to be left to the Senhor Librаó, Administrador do Concelho, whose influence among the people, and intimate knowledge of their habits, added to his position as a magistrate, will best insure their being properly performed.

(Signed) J. O. Mc WILLIAM, M.D.,
Surgeon, H.B.M. R.N.

Boã Vista, Cape de Verds, July 10, 1846.



Island of Boã Vista in The Cape de Verds



CAPE VERD ISLANDS.

From the best Authorities and latest Surveys.

P.H.F. Phelps delᵗ.

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[illegible]

INDIA OFFICE.

SCHEME
FOR
OBTAINING A BETTER KNOWLEDGE
OF
THE ENDEMIC SKIN DISEASES
OF
INDIA.

PREPARED BY

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ETC., ETC.

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1872.

SCHEME

FOR

OBTAINING A BETTER KNOWLEDGE OF THE ENDEMIC SKIN DISEASES OF INDIA.

GENERAL REMARKS.

A.—Objects and Mode of the Inquiry.

Two main objects are proposed :—

1. To obtain and then to circulate a better knowledge of the more important endemic skin diseases of India, or such as principally attack the skin; and thereby
2. To bring about an agreement, which is far from existing at present, between the profession in India and in England as to the nomenclature, the typical character, the varieties, and the probable or demonstrated causes of the diseases in question.

At present very considerable confusion arises from the want of an agreement as to the use to which particular terms should be put—elephantiasis for example—the same disorder being spoken of by different persons under different names, and *vice versâ*. The prevention of such confusion would itself be a great gain to science, as it would enable observers to conduct investigations relative to diseases with infinitely less labour and unquestionably with greater certainty of obtaining reliable data.

One special though indirect result of the inquiry would be, that those who were training in this country for medical service in India would be enabled to acquire with no little readiness a satisfactory knowledge of a certain class of diseases of the commonest occurrence in India, the components of which class they would have at once to treat on their arrival in that country, and of which no great amount of clinical experience can be obtained in England. Further, the inquiry would be of great use to the English, and indeed the Continental practitioner, in furnishing him with valuable guides for the more speedy recognition and the better treatment of the numerous cases of peculiar skin diseases that are imported into this country and elsewhere from India, a locality that abounds in material for scientific investigation as regards the influence of climate, &c. upon cutaneous disease.

It is also believed that the inquiry may tend to show not only what are the special diseases due directly to special climatic influences, but also the character and extent of variations in the same disease induced by differences of climate: for the same disease does undoubtedly vary in its characters in different countries.

The mode in which it is believed the objects above stated may be easily secured is by seeking the assistance of the scattered and able medical officers of India in the collection of facts, and by utilising and unifying the experience and opinions of these gentlemen.

The details of the scheme are so arranged as to remove, it is believed, some of the special difficulties under which the Indian medical officer labours in the prosecution of careful investigations into the nature and causes of disease in India; though in the face of very special obstacles it is surprising how good is the work done by Indian observers from time to time. Reference is specially made to the few opportunities afforded Indian medical officers of consulting libraries, of obtaining access to the multifarious periodical publications in which are recorded the most recent researches of European pathologists, the difficulty of carrying about with them the necessary apparatus for minute and experimental inquiry, and the like.

The difficulties referred to will be in great measure lessened by giving a resumé of the latest researches and the opinions of European dermatologists relative to the various diseases to which it is thought desirable to direct attention, and by indicating the points of doubt which require to be cleared up, and the line of investigation which should be pursued in the future, for the further elucidation of the nature and causes of particular diseases.

By indicating the several points upon which information is specially needed, not only will the main objects of the inquiry be promoted, but the time and labour of Indian medical officers will be greatly economised.

The endemic skin diseases of India deserve to be studied for themselves for several reasons. They are a great source of distress to sufferers from their attacks. They are the indications in many cases of morbid action, affecting the body profoundly and arising from preventible causes, and when closely studied they afford valuable information as to the causation of disease. They crucially test the action of remedies, whilst a more correct and a wider knowledge of their causation will greatly tend to increase the confidence of man, be he European or native, in the power of hygiene and medicine to relieve suffering. It is not at all unlikely, moreover, from concentration of attention to this, till recently, but slightly cultivated branch of medical science, important facts may be gained as to the nature and action of remedies which are successfully employed by European and native medical men in India, but with which we are unacquainted in this country. Some of these remedies are frequently mixed up with inert or dangerously active substances which compose the lengthy prescriptions of the hakeem, in such a way as to render it a matter of difficulty to determine what the active powers of these medicines individually are. Already something has been done to define them by medical officers in India, who would be glad to see them attract the attention of the therapeutic student in Europe. Many good drugs have still to be recognised, and they are considered too valuable to be disclosed by the native practitioner. With the progress of education, however, it is to be hoped the prejudices that lead to secrecy will be overcome, and the real or pretended powers of many undisclosed remedies be fully understood.

B.—Scheme of the Inquiry.

The scheme is, as before indicated, to give under the head of particular diseases, a brief statement of the views of the leading European dermatologists as to the nature of these diseases, to indicate doubtful points and the chief questions to be now determined in regard to them, and to ask for answers to precise questions.

The following heads indicate the kind and extent of information sought :—

a. The accurate observation of cases, especially with reference to the exact mode of origin of disease.

b. The microscopic characters of morbid products.

c. Precise information, inasmuch as climatic influences have much to do with the genesis of disease in India, touching the name and character of particular localities in which particular diseases prevail, with exact statements as to the nature and alliances of those diseases. [Situated as medical men are in India, in such varying climates and among such different races acted upon by such a variety of circumstances as to food and clothing, &c., they might gather valuable information about the geography of diseases of the skin. It is notorious that sharp lines seem to cut some diseases off from different parts of the country. This is the case as regards severe forms of itch, leprosy, Madura foot, Delhi sores, &c.]

d. The nature and peculiarities of the food and water supply of the affected population.

e. The tribes or castes in which particular diseases occur, and the habits of these tribes, ex. migratory or otherwise. [The influence of certain religious practices, such as that of covering the body with ashes and other earths, as followed by fakeers and religious medicants, deserves notice.]

f. The occupation of the attacked.

g. The dress of the attacked, especially with regard to the exposed or unexposed nature of the seats of disease. [It is an interesting question, for example, to determine whether the diseases of the scalp are more frequently developed in races that cut short their hair and shave their head, or among those who keep their hair long. Many of the Hindoos shave all or the most of their scalp, head, arm-pits, &c. The Mahommedans, as the rule, cut the hair close. The whole Seikh race never allows a razor or scissors to touch a hair. Many millions of Indians go about bareheaded; others wear only skull caps; others wear great masses of cloth like table-cloths on their heads. The influence of these practices on disease it is important to know.]

h. The observed differences between diseases as seen in the darker races of the East and in Europeans, and the differences in the same disease as observed in India and in Europe.

j. The connexion between season and disease. [Where the variety of climate is so great as in India, the observation of this point might lead to important results.]

The following are the diseases to which it is thought desirable that attention should be directed:—

1. Morphœa.
2. Scleroderma.
3. Frambœsia.
4. Delhi sore.
5. Keloid.
6. Fibroma.
7. The Elephant leg, or Elephantiasis Arabum, or tropical big leg.
8. The Fungus foot of India, or Madura foot.
9. The true Leprosy, or Elephantiasis Græcorum.
10. Leucoderma.
11. Pityriasis vesicolor in unusual forms.
12. Burmese ringworm.
13. Malabar itch.
14. Lichen tropicus, or prickly heat.

N.B.—The information which is particularly asked for, is essentially such as is precise. Mere general statements or replies to questions of a wide and general character are specially undesired. Special forms for note-taking and for tabulating cases are given with the accounts of certain of the diseases.

When sufficient data have been collected a special summary report will be made on the whole subject. Each observer will have full credit given him for any contribution he may furnish towards the report.

Morbid specimens properly preserved, if sent home, would be thoroughly investigated and the results embodied in any report made. Representations of diseases in the way of photographs, sketches, and coloured drawings will be very useful.

MORPHŒA.

This disease is in all probability of pretty frequent occurrence in the East, though mostly unrecognised. It is not unlikely that it is confounded with other affections of a similar nature, leucoderma to wit. There are no data in our possession at the present time to show that the disease is either rare or common in India; but *à priori* considerations, especially the asserted alliance of the disease with and the similarity of certain of its characters to leprosy, would lead one to expect that it will be found to be of not infrequent occurrence in that country.

Use and relation of the term Morphœa.—Morphœa signifies form. It is in reality the same disease as that described by Dr. Addison as Keloid, as in fact "Addison's Keloid," a disease wholly different from the Keloid of Alibert. It is most unfortunate that Dr. Addison should have employed the term Keloid to describe it, and that certain writers should have continued to the present time to designate it as "Addison's" Keloid. The latter term is now appropriated by general consent to signify, in accordance with the original use to which it was put by Alibert, a fibrous outgrowth of the skin, *c.i.*, Keloid. As it is impossible to apply the term to two diseases of a totally different kind, the innovation of Addison must certainly give way to the priority of Alibert. The term Morphœa, therefore, as used by Mr. Erasmus Wilson, for the disease about to be described, is much the best.

Typical characters.—Morphœa in the European is characterised by the presence of circumscribed patches, varying in size from that of a pea to two, three, or more inches, whose surface is non-elevated, white like alabaster, polished, smooth, dense, and feeling and looking as though it were the seat of a deposit like white, or faintly yellow-white, wax. The disease is not an outgrowth, not a mere discoloration, but due to organic change in the skin structures. In well-marked cases the centres of the patches are more or less anæsthetic. There is generally a distinct halo of redness at the circumference, in the form of a lilac-coloured vascular ring, and this redness may be at times only very faintly marked, but at others more distinctly visible. The cuticle does not actually desquamate, but it shrivels up, being slightly discoloured and dirty-looking at times, but not always. The skin around the patches is often somewhat more pigmented than usual, and the whiteness of the patch may not be so distinct from such a cause: hence the terms *morphœa alba* and *morphœa nigra*. There may be only one patch or several. In a case now under observation the whole trunk is marked by large patches that look at a distance like large wheals with their white centres and red circumferences, but these patches feel firm and are constant and not itchy, so that their true nature is at once seen on careful inspection. The disease begins by slightly red spots, the centre of which presently levels down a little below the ordinary surface, then becomes white from the presence of the commencing deposit, the lilac ring gradually widening out in all directions as the latter augments. The seats of the patches are, in order of frequency: the back of the neck, the upper part of the chest, the mammary region, the abdomen, the upper part of the thigh and the arm, the forehead, and the cheeks. When the deposit has existed awhile, a stage of atrophy may ensue; the spots become thinned from the removal of the peculiar deposit and they waste, a scar-like state of tissue being left. This is the so-called morphœa atrophica. But the disease only follows the rule of certain new growths, ex., syphilitic tubercles, leprosy, and the like, in this respect; the atrophy is much more speedily produced in some cases than in others, and under these circumstances it may seem to be the most marked feature in the disease. Morphœa is mostly unilateral, it occurs in females especially, and such as are of weak constitution; and it is said oftentimes in pregnant women. It is very chronic, and disappears slowly after having lasted, it may be, a good many years.

Nature of the disease.—Morphœa is held to be a fibroid degeneration, involving the whole thickness of the skin; but more information is needed on this point, and specimens taken from the affected would be especially interesting objects for microscopic studies.

Diseases liable to be confounded with Morphœa.—The following have to be distinguished from morphœa: (1) In the first place, Leucoderma, which is merely white skin, resulting from deficiency of pigment in a particular spot or spots, *without any textural alteration* whatever. If the colour only be attended to, and the deposit feature be overlooked, error is likely to occur. (2) Secondly, Keloid, but this is an actual outgrowth of contractile fibro-cellular tissue, in which the elastic elements are unusually abundant; and (3) Thirdly, the early eruptive phase of Leprosy, as seen in the anæsthetic form. This is particularly referred to in the next paragraph.

Points to be cleared up.—These are chiefly two; (*a.*) the connexion between Morphœa and Scleroderma, *i.e.*, the hide-bound disease; and (*b.*) between Morphœa and Leprosy.

In regard to the first point, it is important to observe that in England the morphœa is observed as the early stage of scleroderma (which will be described next in order), not always but not infrequently. Some think that morphœa is in reality a circumscribed scleroderma, or scleriasis, as it is sometimes called. With reference to the second point, it may be observed that in leprosy certain anæsthetic patches with depressed centres, and it may be vascular edges, arising out of erythematous rednesses, or after bullæ or brown discolourations, are present, as described so admirably by Dr. Vandyke Carter. These discoloured anæsthetic patches have been called morphœa, and the question arises whether these patches and true morphœa, are one and the same in nature. It is probable that there is only similarity, not identity, between the two; in each case there is a new deposit that destroys the skin, and alters the pigmentation, atrophy following; but in leprosy we do not have the white waxy deposit from the outset, and as the whole disease, but clearly a new deposit of different character, accompanied by evidence of general nutritive disorder, involving especially the nerve trunks. We have a case under our care now in a lad from Demerara, who has large brownish patches on the face (both sides), and the arms, and extensive tracts of disease extending from the middle of the thigh to near the ankle, the boundary of the patches being slightly raised, dull brown, somewhat scaly, the general area dry, shrivelled-looking, dullish white, and feeling somewhat thinned: the sensibility being blunted over the whole of the diseased patches. The follicles of the skin appear as if congested, and as though they had been the seat of deposit, which had been almost entirely absorbed and had left behind a certain amount of atrophy. It is only when a pin is thrust deeply into the skin that the boy feels pain. There are one or two marked anæsthetic spots. There are little masses of deposit in the pharynx. The disease commenced by brown stainings, and appeared in the face nine months since. The boy has had "fever and ague" in Demerara. First came brown stainings, then thickening, then a certain "paling and shrivelling" of the skin, with a dark scaly extending edge, and the blunting of the sensibility of the affected parts. The disease is not psoriasis. There is no hyperæmia, no hypertrophy of the papillary layer of the skin, no free scaliness, no affection of the elbows and knees. The disease is clearly "leprous."

Questions suggested for replies.—The following queries are specially applicable to the case of morphœa:—

1. Is the disease common or is it ever observed in your district?
2. How many cases have you yourself observed?
3. What is the mode of origin and course of the disease?
4. The age, sex, peculiarities in the occupation and the food of the attacked?
5. The seat of the disease, unilateral or general? One patch or more?
6. Does the disease usually exist by itself as the sole disease?
7. Is it associated with scleroderma, *i.e.*, hide-bound disease?
8. Is it identical or only similar with the white anæsthetic patches of leprosy?
9. Is it accompanied by any disease of the nervous system, such as paralysis? and if so, is this only coincidently so?
10. Does it present any peculiarities when it occurs in the dark as compared with the whiter races?
11. What are the microscopic characters of the deposit?
12. What name do the hakeems give the disease, and to what cause do they attribute it?

N.B.—No attempt has been made as regards morphœa to prove or disprove its connection with the Leuke of the Greeks or the Vitiligo of Celsus. We have used the word morphœa as the modern and accepted designation, in a modern sense, for a well-known form of disease, the object being to get at the experience of modern observers, and not the views and opinions of the past.

N.B.—Any portions of skin affected with the disease may be preserved in a weak chromic acid solution (1 or 2 per cent. strength).

SCLERODERMA.

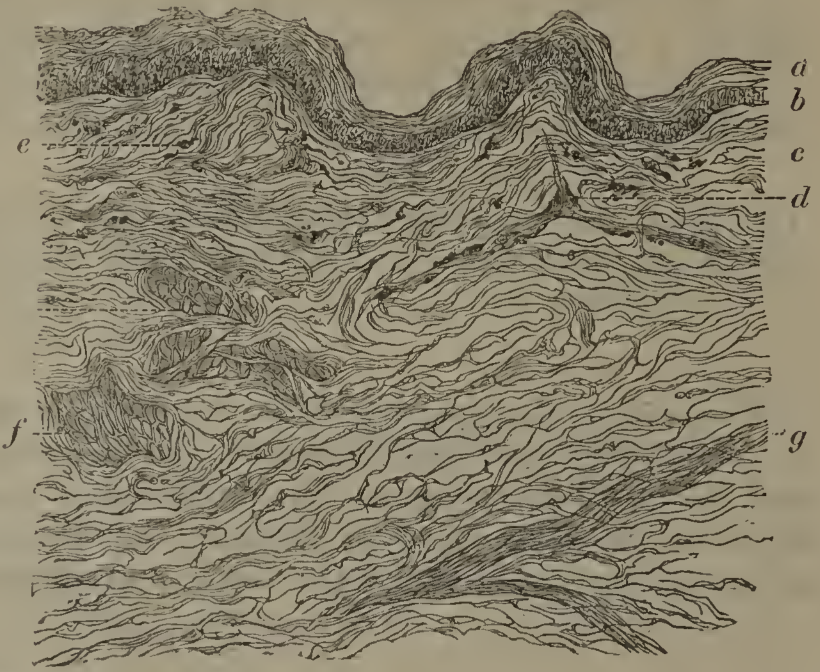
In the year 1854 Thirial first drew attention to this disease in a paper entitled "Du Sclerème chez les adultes." The subsequent names given it have been Scleroderma (Kretschmar, Schmidts Jahrb., vol. cxxvi); Scleriasis; Hide-bound disease; Scleroma, etc. Scleroderma seems to be the best, as it implies hardened skin, whereas scleriasis signifies rather the act or process of hardening.

Typical characters.—These are readily given. At first there is stiffness in a part whose movements are thereby somewhat interfered with, ex., in the nape of the neck, where the disease frequently begins. Then come hardness or horny induration, denseness but not pitting on pressure. The stiffness and induration may come on suddenly over a large area, and subsequently extend in bands or raised lines to a greater or less distance. The skin cannot be pinched up, and it is more or less immoveable over the subjacent parts. The bands or plates of induration may run down the whole back or along the entire length of a thigh or an arm. The diseased surface is yellowish or waxy-looking, and the hue fades away in colour through a dull white into that of the surrounding healthy integuments. There may be a partial boundary line of vessels at the edge of the disease. The deposit contracts somewhat, the skin becoming dryer, denser, more parchment-like, whilst there is much deformity produced, especially about the face and joints, when these are the seats of the disease. Sensation is not at first but only subsequently impaired. Several parts of the body are successively affected. Females are attacked more than males. There are sometimes one or more patches of morphœa present in addition, or the edges of the band or the indurated area may present the aspect of morphœa, being of a whitish hue, though raised. Scleroderma, when in bands or ridges, is distinctly raised. One writer remarks that "the appearance is not "that of a tumour, but rather as if the arm had been burnt and had left a leather-"like hardness, which required surgical operation as after a burn to remove it, or "it seems as if a bad erysipelas had become turned into cartilage and bone." (Lancet, 1855.) Dr. Fagge has found the liver tough and thickened, and its fibro-cellular elements increased. The induration in this disease oftentimes after some time disappears.

Nature of the disease.—The disease is supposed to be "fibroid hypertrophy of the "skin;" the papillary layer is intact, but bands of closely-packed connective tissue extend into it. The distinction between the corium and subjacent cellular tissues is lost. All the fibro-cellular elements are increased in amount, the fat is absent, the capillaries fewer than natural, the glands unaltered, and the nerves imbedded in the hypertrophied tissue. Now and then are seen collections of connective tissue cells in different parts of the corium.

The accompanying illustration is from Neumann's work, for the use of which we are indebted to Dr. Pullar.

Relation to Morphœa and Leprosy.—It is thought that morphœa and scleroderma are essentially one and the same disease, the one being the diffused, the other circumscribed form. They occur together in the same subject, hence this opinion is probably true. But we want more evidence on this point; see questions under the head of Morphœa. It is further a most interesting question whether there is any connection between leprosy and scleroderma. We need information on this point also, we have nothing at present but assertion to deal with.



a. epidermis. *b.* pigmented Malpighian layer. *c.* dense fibrous bands. *d.* isolated vascular strand (pigmented). *e.* minute clump of pigment. *f.* transverse section of muscular fibres. *g.* muscular fibres.

The following queries are specially applicable to the case of scleroderma:—

1. Is it common or rare in India? Have you observed it?
2. Age, sex, and occupation of the attacked?
3. The usual seat of the disease?
4. Does it usually exist *per se?* Is it often preceded by morphœa? or conjoined with it?
5. Is it ever a stage of leprosy, or is there any reason to believe the two are related?
6. Does it offer any peculiarities as it occurs in the dark races?

7. In any post-mortem examinations made, what has been the condition of the internal organs?
8. The microscopic appearances presented by the diseased skin?

N.B.—In relation to morphœa and scleroderma, it is of the highest importance to remember in making a diagnosis, the admitted distinction between leprosy and these two diseases. Morphœa may be mistaken for the white anæsthetic patches of leprosy, and vice versâ, and scleroderma for the general thickening of the skin in leprosy. We assume, however, that leprosy on the one, and the two other diseases on the other hand have no relation to each other.

FRAMBŒSIA OR YAWS.

It will be interesting as well as important to learn whether this disease, which is common in Africa and Guinea, and from whence it is conveyed to the West Indies and America, is observed in any of our East Indian possessions. It is quite possible that the disease may have reached India lately through the return of the emigrant coolies who have resided for some time in the West Indian islands, and if any cases occur at the English dispensaries, it will be desirable to inquire into the probabilities of the conveyance of frambœsia from locality to locality by human agency.

A good descriptive history and representations of the disease, as regards its mode of origin, course, naked-eye and minute characters, are much wanted, and if Indian medical officers would furnish the same they would be doing medical science a great service.

General features and nature of the disease.—Frambœsia is said to be an eruptive disease of zymotic origin, commencing with malaise weakness and pains like those of rheumatism, followed by the development about the face, axillæ, arms, and genitals of small red papular spots more or less grouped, and varying in size from that of a pin's head to half an inch. The spots are slightly raised, and in some cases speedily disappear, whilst in others, the papules become pustular, give out a thin ichor, then enlarge, and become crusted over, the crusts hiding a raw surface remarkable for the exuberance of its granulations. The skin around is harsh and dry. Troublesome ulcers succeed certain of the papulæ, but are always superficial and heal at length without any scarring being left. Most of the granulating surfaces however take on a peculiar morbid action, whereby fungoid elevations acquiring a resemblance in a few weeks to raspberries (hence the term frambœsia) are produced There are generally several of these sprouting masses together, joined by their bases as it were, but free at their apices, and usually one of them becomes larger, and is more prominent than the rest, and receives the name of mama or mother-yaw. It presently ulcerates and leaves behind a foul ulcer. The disease attacks children particularly, and lasts with them from three to six months, and in the adult six to twelve months. There is a somewhat curious but very general belief in Africa, that frambœsia takes the place of measles and scarlatina, which notion is in all likelihood merely an indication of the commonness of the disease. Frambœsia attacks the darker races more readily than the fair-skinned. It is said to be communicable from person to person through the inoculation of the discharge accompanying it, and so may be transmitted from individuals through the agency of flies. It is said moreover to occur but once in a lifetime. It is never fatal. Its nature is not understood.

Remarks.—One cannot help seeing that such diseases as Delhi sore or boil, Moultan sores, Biskra-bouton, and Aleppo evil, to be noticed in detail presently, have many points in common with frambœsia, provided we allow for the tendency in certain of the dark races to hypertrophous growth of the white fibrous tissue of the skin in and about wounds and ulcers, a tendency well marked in the case of frambœsia. If we recognise this tendency, it is not difficult to see in the origin of frambœsia from an indolent papule or a pustule, and the subsequent occurrence of unhealthy ulceration, the probable operation of some deteriorated blood condition, caused by climatic influences, as in the other diseases named.

In the Aleppo evil, when the tumour is single, we have the male variety, when there are several smaller tumours surrounding a large one, the latter is, as in frambœsia, called the female. But in the Delhi and Moultan sores there is no hypertrophy of the fibro-cellular tissue. Is it because a different race is concerned, as compared with that which is attacked by frambœsia. Observers should not forget the importance of bearing in mind, in the conduct of investigations, that the same skin affection, especially such as is of an ulcerative kind, may vary very considerably in external features, according as it occurs in different races.

DELHI BOIL OR SORE.

Syn. Aurungzebe or Bulkea.

The Aleppo evil, Biskra-bouton, and Scinde boil will be noticed under this head.

The attention of India medical officers has been so frequently and distinctly directed of late to the disease, Delhi boil, that the present is a peculiarly fitting time to institute a specific inquiry into its nature, and to direct the attention of observers categorically to the more important and particular points in its history demanding investigation. The name Delhi boil is to some extent an unfortunate one, inasmuch as the disease is not peculiar to, though perhaps most prevalent at Delhi, but is known to occur in many localities in different parts of the East, ex., Scinde, Lahore, Moultan, Agra, Aden, Meerut, Roorkee, Umballa. The so-called Lahore, and it may be the Scinde boils, though there is doubt on the point to be presently noted as regards the latter, the Moultan sores, probably the Aleppo evil, and the Biskra-bouton (Algeria), are it would seem the same disease. It would not, however, be well to change the name before we are quite convinced by further investigation that these several diseases are of the same nature, and more light is thrown upon their pathology and cause. Some such term as Oriental sore or pustule might then be employed to designate the disease as it occurs in various parts of the world. The word Delhi sore is, however, preferable to Delhi boil.

Typical characters and cause of the disease known as "Delhi boil."—The disease has been described as commencing by itching, followed by the development of a reddish spot, in the centre of which appears a papule or two, giving rise to the aspect of a wart, or as it has been described, "a small hard pimple, which when first " seen has desquamating epithelial scales on its top." Dr. Fleming (Army Medical Report, 1869) depicts the original appearance as resembling "a musquito bite with " the skin slightly elevated, on examination a number of blood vessels are seen " radiating to the centre of this little red spot, which gradually enlarges without " any pain, throws off its epithelium, becomes smooth and flat on the surface, " assumes a shining appearance and a relative degree of transparency. The growth " slowly increases in size and often spreads irregularly to a considerable distance from " the centre by little ridges of smooth skin, and it would appear to attack the roots " of the hair and sheath first whilst it is extending. The growth or any of its " prolongations, pits on pressure and causes a stinging sensation, contrasting with " the healthy skin around." Others have described the enlargement of the original spot to be in part produced by the development of new papules around the original one, these papules being seated at the hair follicles. These new spots coalescing with the original one and themselves, and producing as above described an inflamed, brownish-looking, shining induration. When matters have advanced thus far, ulceration is imminent, and the surface may be seen to be studded over with deeply seated yellowish-white points, which have been regarded as points of suppuration, and ova, but are in reality altered and inflamed hair and gland sacs. Presently a scab forms by the aggregation of epithelial scales and a certain amount of ichor discharged from the soft centre of the tumour, and then ulceration begins beneath the scab, especially if the "boil" is irritated. There is some slight variation described by observers in the early condition of the boil; for example, it is said that before the scabbing takes place the papule may suppurate or give place to a small abscess, and this we can easily understand. What is always found present is the ulceration going on beneath a crusted pustule. As before observed, the discharge and crusting rapidly augment with irritation. The sore itself is surrounded by a zone of redness, and new papules develope around it, whilst the sore enlarges by ulceration, is very indolent, and fails to show for a long time any tendency to heal. In some cases the disease is altogether of a less marked kind than we have now described, there is no suppuration, less ulceration, and scarcely a cicatrix left behind after cure. The ulcerated surface itself, when present, is red, flabby, and irregular, being studded over by fungoid granulations that bled freely. The surface discharges a thin ichor and it is painful. Its edges are hard.

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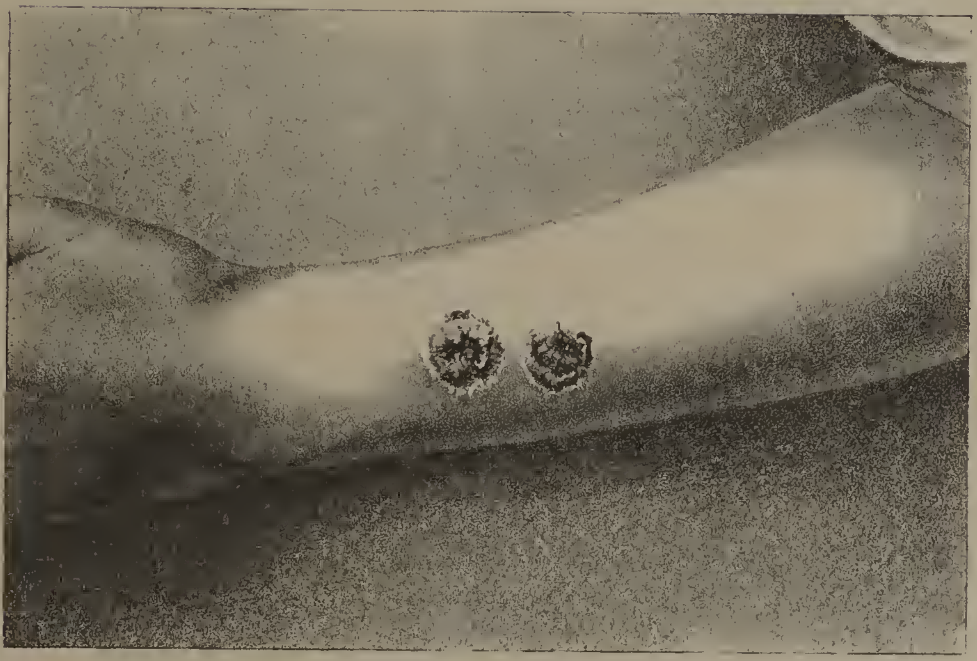
Plate I



"DELHI ULCERS" produced by Inoculation of peculiar brownish cells _ Plate III figs. C & D.

22nd March, 1870.

Vincent Brooks Day & Son Lith

Dr. Fleming (Indian Medical Gazette, Nov. 1869) particularly calls attention to the fact that during the growth of the tumour and up to the period when ulceration begins, and when the "boil" is relatively transparent and shiny, the small yellowish or yellowish white bodies before referred to as the hair sacs, may be detected with a lens. If these be cut out they will be found to be altered hair sacs, and they will sometimes come away attached to adherent scabs which are forcibly detached (See Dr. Cleghorn, Medical History of the Bengal Native Army for 1868, by Surgeon-Major Ross). As the ulceration advances, signs of healing show themselves in the centre of the original seat of disease, and cicatricial tissue springing up gradually spreads farther and farther outwards as the ulceration extends, and the sore finally heals after two or three months, a scar remaining. The accompanying Pl. I. is Dr. Fleming's representation of Delhi boil (Army Medical Blue Book, 1869).

The Aleppo evil, endemic about Tigris, the Euphrates at Aleppo, and Bagdad, begins, as far as we know, by a papulation which presently takes on a pustular character, then scabs over whilst ulceration goes on beneath, exactly as in the Delhi sore or boil.

Biskra-bouton, especially prevalent and endemic in the districts of Constantine in Algeria (see Paynter, Army Medical Reports for 1867, p. 438), and in other parts, ex., Morocco, commences by itching, then a small tubercle very superficially seated appears, and this enlarges, whilst the epidermis scales off, the centre often discharges a thin ichor, scabs and ulcerates, so that a disease like anthrax is produced. It is said to be like the Aleppo evil. This is what we are told.

Now in comparing Delhi boil, Biskra-bouton, and the Aleppo evil together, certain analogies are recognized. In the first place, they all attack the exposed parts, ex., the backs of the hands, the uncovered arms and legs, the backs of the feet, the nose, cheeks, and ears, &c. They all last about the same time, from several months to a year, or a little more. They similarly attack all ranks, ages, and classes, but especially new-comers, after a three or four months' residence; they all leave cicatrices, and so on. The Delhi boil attacks dogs, but this has not been stated of the Biskra-bouton nor of the Aleppo evil, though horses are attacked by the Biskra-bouton. However the inter-relationship of these diseases is a matter that requires investigation. Delhi boil and Biskra-bouton seem to be especially prevalent after rains. In each disease the general health does not suffer greatly, if at all, and the three diseases are known to have oftentimes a long period of incubation. They break out now and then a long time even after the removal of the patient from the places where the diseases are endemic.

[It may be here stated, in reference to the observation that Scinde boil is probably Delhi boil, that Dr. Farquhar's experience leads him to conclude that the ordinary Scinde boil is very different from Delhi boil. There may be the Delhi boil in Scinde, he allows, but the Scinde boil is, according to his opinion, a true "furunculus," a severe form of the boils that are so very frequent in the rainy season all over India. These boils are seldom met with till after the first fall of rain, and are in many places believed to be connected with the eating of mangoes. This supposition is apparently, however, a mistake, and arises from the fact of mangoes getting ripe and fit for eating just after the first fall of rain. Dr. Farquhar has seen these "rain boils" occur as frequently in districts of India where no mangoes were to be had, as where they are plentiful. The boils appear to be of a malarious origin: their strange frequency in the legs being explicable probably by the dependant position rendering the circulation torpid.

Europeans suffer more than natives from these boils, which are sometimes very trying to the general health from the pain they occasion. The inflammation will sometimes cover half the leg below the knee, and the induration be as large as a crown piece. At other times these boils are about the size of a sixpence. Dr. Farquhar has counted as many as five-and-twenty on an adult's leg in the middle of October, all more or less in an active state, and he has also known a Scinde boil kill a strong man through continuous sloughing of the core and edges; erysipelatous attacks supervening and exhausting the patient. Poultices favour the reproduction of these boils tenfold at times.

It is important to gain the views of others on the question of the nature of Scinde boil, and as to whether Delhi sores occur as a distinct disease in Scinde.]

[The two following are extracted from Dr. Tilbury Fox's work of Skin Diseases.]

Fig. 1.

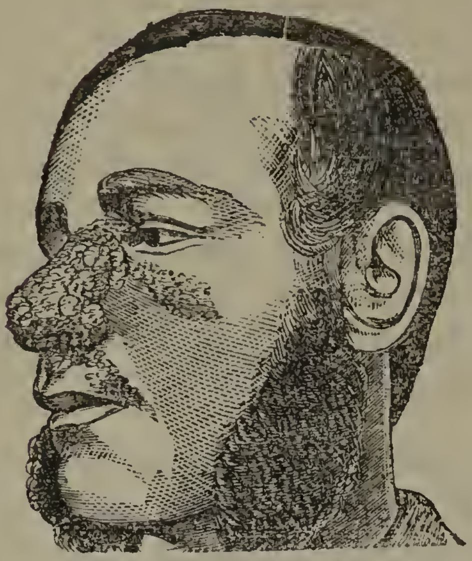
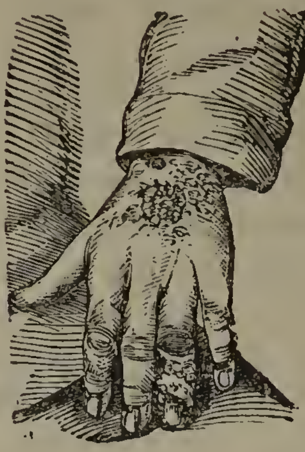


Fig. 2.



Morbid Anatomy.—Most interesting observations have lately been made by Surgeon-Major Smith (Army Med. Rep., 1868, vol. x.) and Dr. Fleming (Army Med. Rep., 1869), as to the microscopic characters of the tumours and ulcers of Delhi sore. The former made out the presence of "a large number of peculiar "bodies, varying in shape from an elongated oval to that of a kidney or crescent- "form." These were of a dark chocolate brown colour as seen by transmitted, and of a bright orange red as viewed by reflected, light. Their average size was probably equal in length to 5 or 6 blood discs by about 2½ to 3 in width. They had distinct cell walls and were filled with minute dark granules, and varied much in transparency. They abounded not only in the discharges but all over the skin. Other cells were found in the discharge from open ulcers like *distomata*, full of granules in some cases, and in others having one end transparent, as though "being "thinned by protrusion and consequent tension at the moment when the spot was "first distinctly visible." On one occasion a curious animalcule was believed to have been discovered in the boil. The cellular bodies, as represented by Surgeon-Major Smith, are seen in Series I., Pl. II.

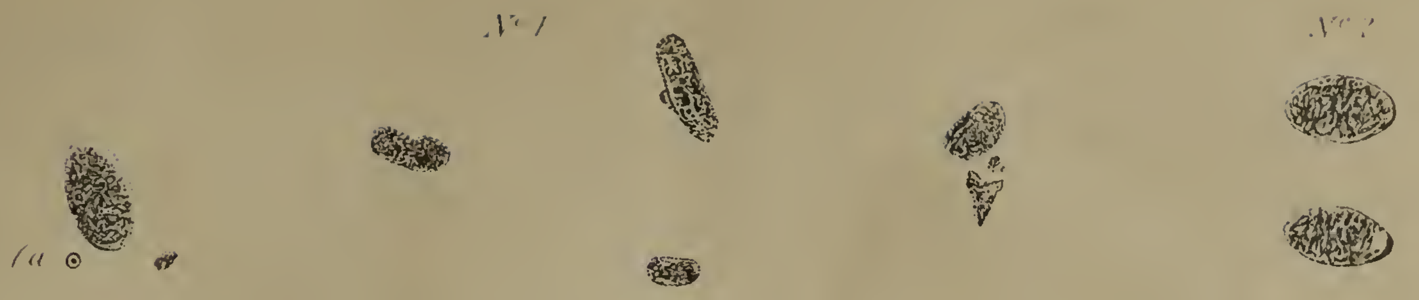
These bodies are probably the ova of distomata from impure water, according to Prof. Aitken, but it is not unlikely that some may be altered epithelial growths pigmented more than usual. They do not appear to have been generally observed.

Dr. Fleming has more recently done much to throw light upon the nature of the diseased processes in Delhi boil. When a section is made of the tumour before ulceration has commenced, the appearances represented at Fig. A., Pl. III., and Fig. R., Pl. IV. will be observed ; and we beg to say here how greatly we are indebted to the courtesy of the Army Medical Department for the use of the plates.

The normal structures are replaced by a fibro-cellular tissue, enclosing in its interstices a large number of cells in masses, the sebaceous glands and sweat glands being destroyed, as well as the papillary layer of the skin. The cells make up the chief part of the boil at this time, *i.e.* before ulceration has commenced. They are seen at C and D, Pl. III., acted upon by acetic acid, and in Series III., Pl. II. They are oval or roundish, yellowish brown, the cell wall being soon destroyed by pressure, and they contain two or more nuclei. The cells are regarded by Dr. Fleming as the essential and peculiar growth of Delhi boil. But then there are very curious changes in the hairs. They appear to be the seat of cystic formations. The epithelial layer is so arranged as to give rise to an appearance of a fibrous envelope, and this encloses a finely granular matter. *See* F, G, H, Pl. III., and K, L, and M, N, in Pl. IV. Series II., Pl. II., are other representations of the altered hair-balls referred to by Dr. Fleming.

In commenting upon these appearances we would be understood as offering suggestions for the guidance of future inquirers. What is there, it may be asked, inconsistent with the idea that the cell growth is but a proliferation of the connective tissue corpuscles, an arrest in their growth, which gives rise to the formation of a kind of granulation tissue, which presently degenerates to a greater or less extent into pus; for the cells have the appearance of pus cells in many cases, so far as their characters are portrayed by Dr. Fleming in his drawings. One can easily understand that such a change may be induced in the tissue of the cutis as the

SERIES I.



These bodies are probably the ova of distomata from impure water according Prof. Aitkin but it is not unlikely that they may be altered Epithelial growths more than usual. They do not appear to have been generally observed

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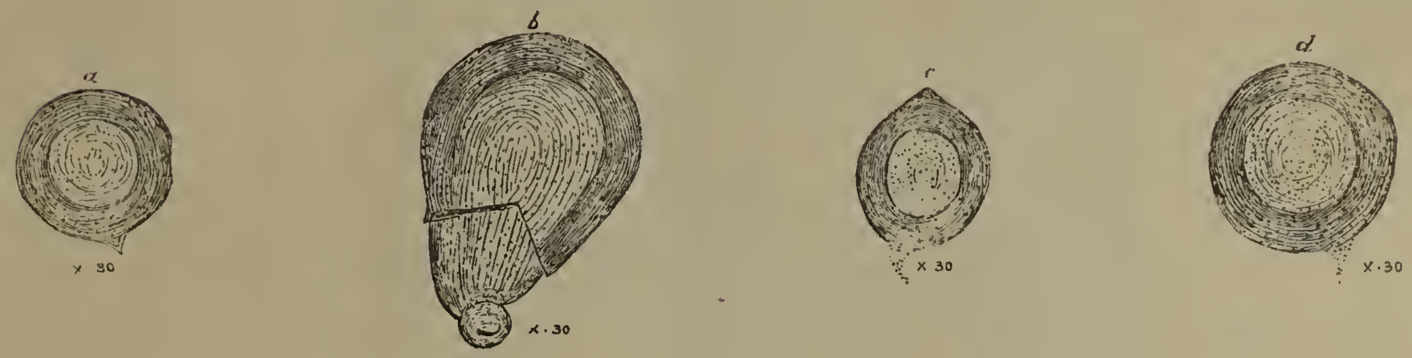


⊢—⊢—⊢ = 100ths of an inch × 30

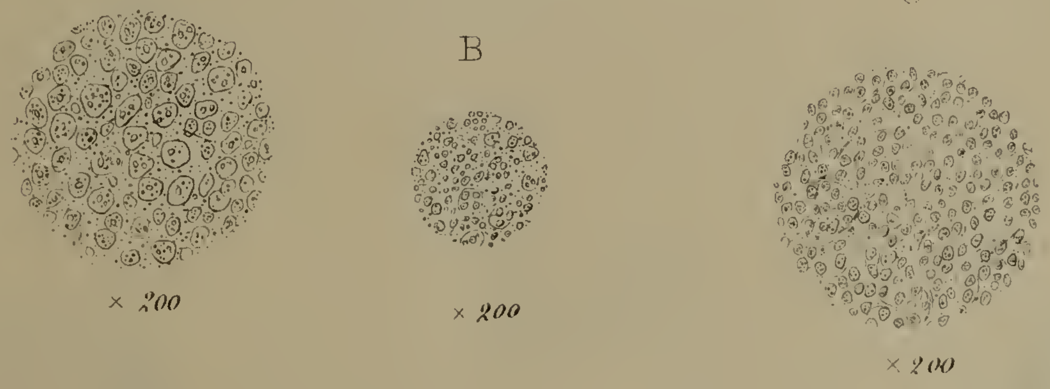
(Drawn by aid of the camera)

Figs. a and b. extracted from Delhi sores, January 1866

Figs. c and d, extracted from Lahore sores, May 1869

The above are representations of the altered hairbulbs referred to by Dr. Fleming These drawings are from specimens in the possession of Dr. Fleming and were obtained from different persons.

SERIES III.



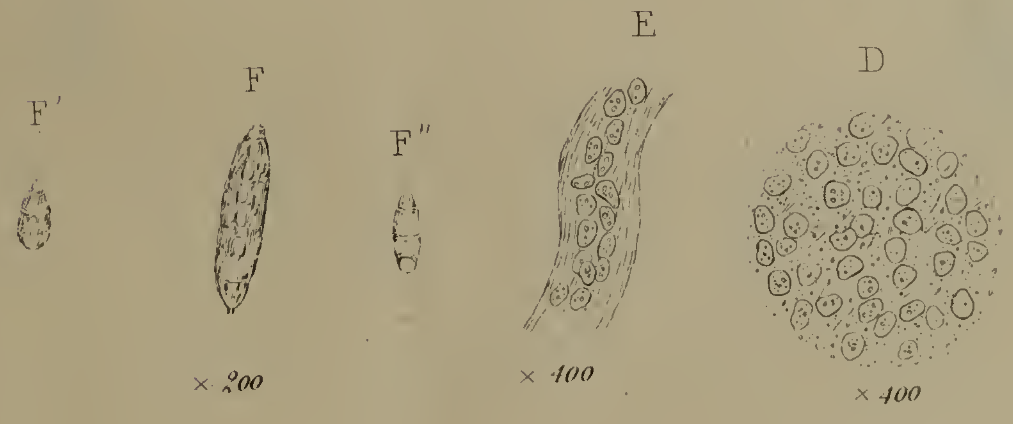


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Fig. A *Pus from a "Delhi Ulcer" produced by Inoculation.*

" B A + *Acetic Acid.*

" C *A Section of the Tumour before Ulceration.*

" D *Part of C highly Magnified.*

" E *Shows a disposition of the Cells, observed in some Sections.*

Acetic Acid has been added in each Case Produced by Inoculation.

F F' F'' *Bodies found in the examination of Pus from Chronic "Delhi Ulcers" magnified 200 diamrs.*

Vincent Brooks Day & Son Lith

to follow plate II

Plate III.

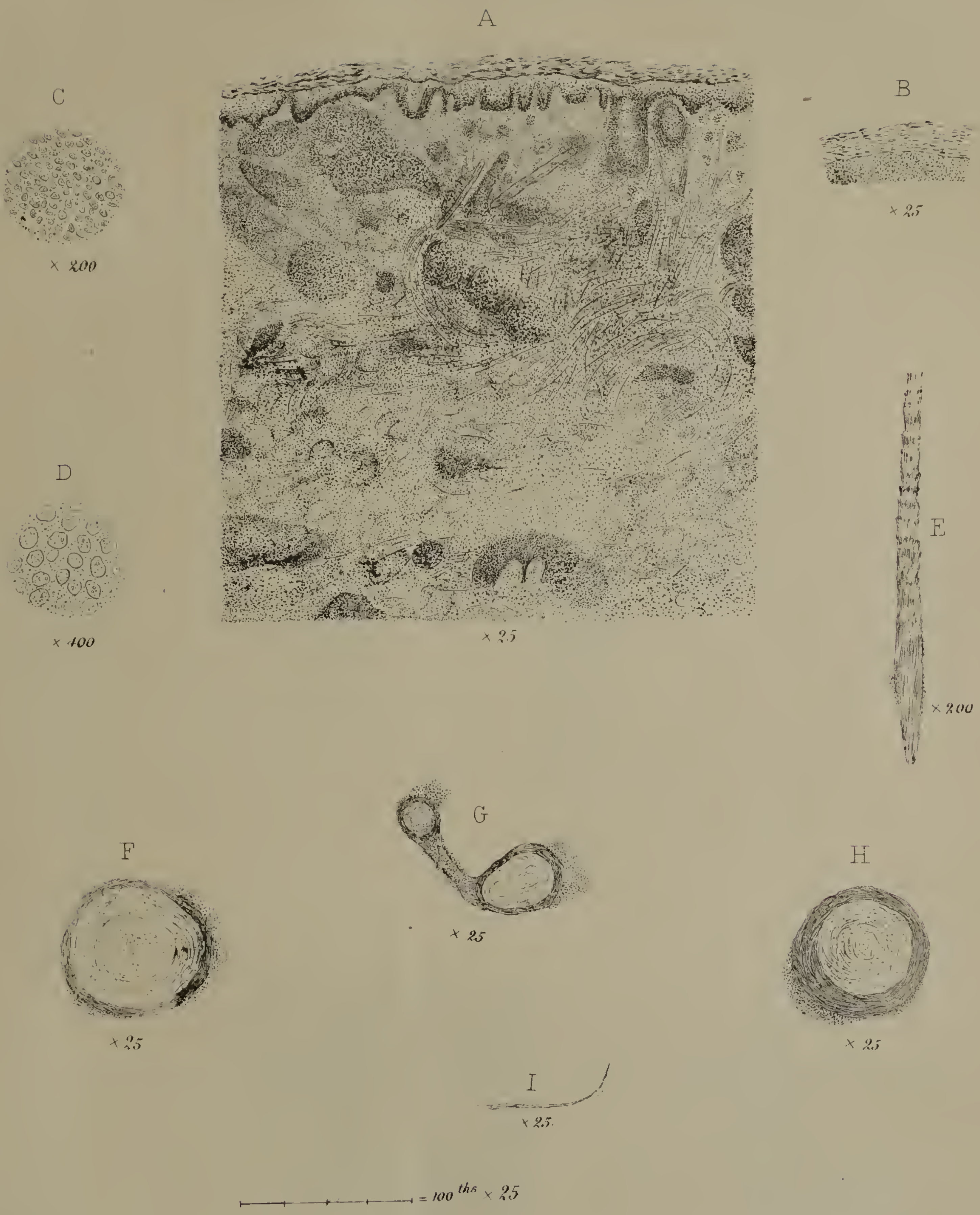


Fig. A *Vertical Section of a Dehli Tumour before Ulceration commenced*

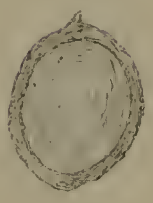
B.... *The same in an advanced stage, showing the Papillæ destroyed*

C & D. *Section of a Delhi Tumour after the addition of Acetic Acid, showing the peculiar Cell structure*

F G & H. *Cystic formations of the hair bulbs & sheaths*

E & I *A fine hair from the interior of F, a Cystic formation*

K



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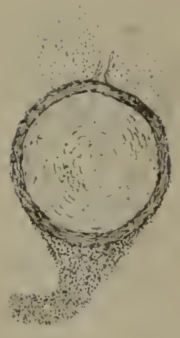
L



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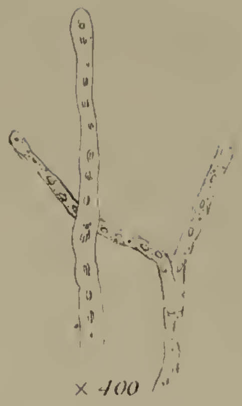

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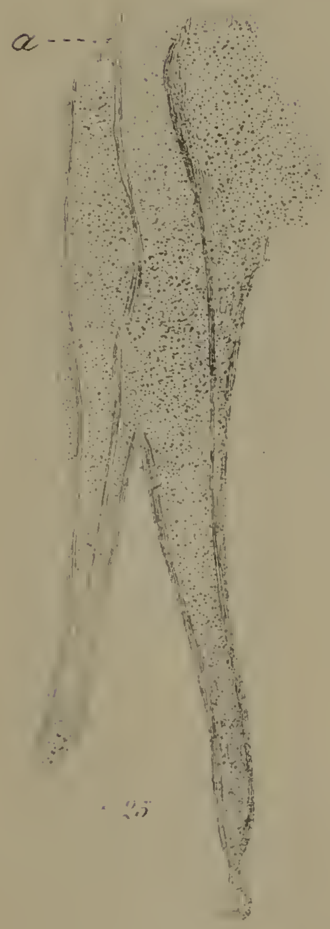
M



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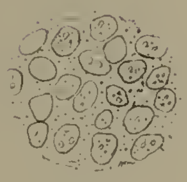
P



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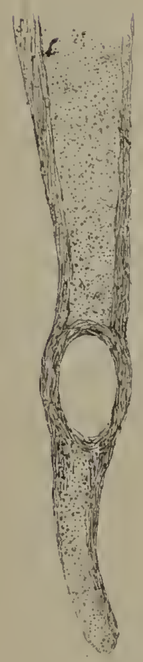
N



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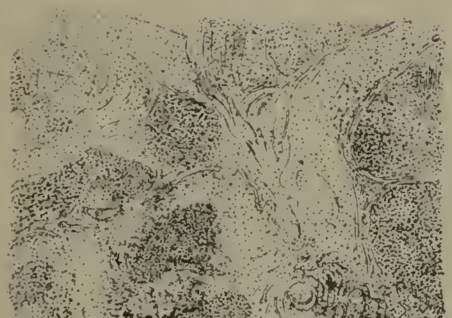
R



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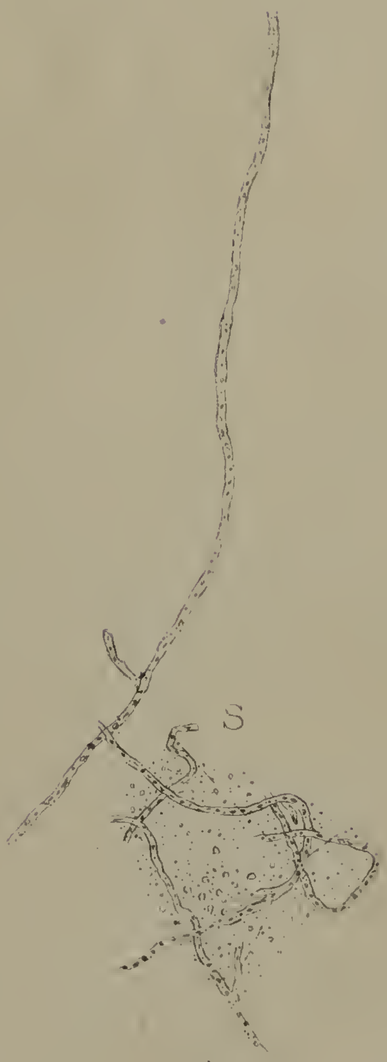
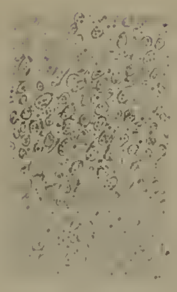
S



× 200

T



300

100ths of an In × 25

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result of impared nutrition. The so-called cystic formations in the hair are evidently due to immaturity of the cells that form the pith, the cortical part being less abundant than usual, a condition seen in other cases where the nutrition of the body is much interfered with, as for instance in syphilis.

It would appear to be a very important point to distinguish clearly, as a means of throwing light upon the true pathology of the disease, between the microscopic appearances observed *before* and *after* ulceration has occurred. There can be little doubt that after ulceration has occurred, and under the peculiar circumstances met with in India, ova fungi and other foreign bodies may readily be conveyed, by means of impure water and the like, to open sores, and so be found in the discharges therefrom, and it would only be the fact of finding these bodies or organisms in the tumours before they ulcerate that could be worth a moment's notice in proof of their being the cause of the disease. The finding ova and the like in the discharge of Delhi sores shows nothing more than that these have probably gained access from without to the discharging surface. Now Dr. Fleming's researches help us greatly upon the point in question. He gives us the characters of the tumour—a new granulation tissue—before there is any ulceration, and he shows that the new cell growth or tissue, if inoculated, will reproduce the disease. But if the cells were pus cells this might be explained by their possessing specific contagious properties, as much as those of gonorrhœal or syphilitic pus. The pus, however, from the Delhi boil will not, if inoculated, induce the disease; there must be with it some of the cell growth described by Dr. Fleming. But after all, the latter may be an early stage of pus, and it may be that in syphilis the inoculable material is not actual pus, but granulation tissue, which is present in chancres and syphilitic ulcers.

Pathology and cause of Delhi boil.—Firstly, it would be well to know the exact seat of the disease at its origin, if the disease affects the hair follicle, or a sebaceous gland, or is situated in the rete or papillary layer. Secondly, we want more information as to the characters of the cell growth described by Dr. Fleming, and as to its origin from the connective tissue corpuscles, escaped white blood cells, or the spindle-shaped cells existing normally in the rete as described by Biesiadecki, and which play such an important part in all inflammatory skin diseases. Specimens of Delhi boil might with advantage be sent home for examination. The disease would seem to be widely existent not only in India, but in Eastern cities generally, so that we must look for a common cause in operation over a wide area, not in anything specially peculiar to Delhi. It is clearly not connected with poverty—Dr. Murray's report seems to show this conclusively; nor does it appear to depend on malaria directly, since it is found to be absent from some of the most malarial districts. Then it has been ascribed to the bite of an insect, but of this there is no positive evidence. Delhi, it is true, is remarkable for its flies, but then Delhi sore is rare, whilst flies abound amongst the suburban population. Then the water has been blamed for the occurrence of the disease, and in two chief ways; firstly, in regard to its impurities, which it is said, taken internally, induce the disease, and secondly, in that the disease is averred to be caused by ova of insects, introduced beneath the skin from the water used for washing. The Biskra-bouton and Aleppo evil are said to be caused by bad water. If the cause be in the water, we must find some condition common to all cases of the three diseases, and the districts wherein they occur. In Dr. Murray's official report, reference is made to the remarkable immunity of a detachment of native cavalry drinking excellent water which they obtained outside the Lahore gate of Delhi. Can similar facts be observed elsewhere, viz., immunity of certain sections of the community who are using a special water supply? Dr. Fleming's observations on the microscopic appearances of Delhi boil before ulceration, in which nothing like ova were observed, would seem to set aside as untenable the doctrine that the disease was due to any parasite, and, as before observed, the fact of parasites being found in ulcers is no evidence that they are the cause of them, and it would be surprising if they were not so found in India. Surgeon Major Smith is the one who inclines to the opinion that the disease is caused by some parasite, and argues that they come from the water used for washing; but Mr. Alcock (Med. Times and Gazette, No. 22, 1870), meets this by saying that the disease does not prevail amongst the water-carriers, as in the case of the guinea-worm disease, which it would do if it were an animal parasitic disease, occasioned by the contact of certain waters with the skin.

But let us notice some other facts. Many observers agree in stating that Delhi sores are very liable to be immediately developed in the seats of abrasions, and that small sores take on in India an ulcerative character like Delhi boils. Dr. Smith speaks of this as occurring in the chafed surfaces which occur in winter, in connexion with the wound of a dog's leg, &c. Mr. Cleghorn notices the same thing (Sketch of Medical History of the Native Bengal Army, 1868), and so does Mr. Alcock (Med. Times and Gazette, loc. cit.), who has seen "an accidental abrasion become "a specific sore within a fortnight." Whether similar occurrences are observed generally in connexion with the development of Delhi boils is a point to notice in future. There can be little question that disorder of the general nutrition induced by climate is one element in the production of Delhi boil and its allies. The parts attacked are those most exposed to musquito bites. After all it may turn out that simple boils, wounds caused by musquitoes, &c., because of the disordered state of health, take on the morbid action observed in Delhi boils. We are not without analogical evidence of disease being induced in like manner in this and other countries. There is a disease of the skin of common occurrence in England—*contagious impetigo*, in which the same kind of thing is observed. In those who are attacked by the disease, the slightest scratch is followed by the development thereon of the characteristic pustule, and other members of the same family, who are free from the disease at the time when that is epidemic, will often be attacked by it in abrasions of the surface. In the West Indies simple sores take on not a suppurative or ulcerative action, though they do this sometimes, but frequently are succeeded by an hypertrophous growth of the fibrous tissue as the result of climatic influences.

Again, from French sources we learn that the French in China suffered from a species of severe ulceration (to which the term Cochin China ulcer was applied), which was ascribed to climatic causes. It attacked at all ages, both sexes, and men of all kinds of constitution. It consisted in "ulceration following some lesion of "the skin, often the most trivial," the legs being most affected, the ulceration not deep as a rule, but occasionally severe and rapid. These and similar facts suggest the question whether after all Delhi sore is not a species of furunculus modified by climatic influences. But there are two other considerations that militate against the doctrine of its local, and in favour of its essentially constitutional nature; the one is the immunity which is the lot of old residents in districts where the disease is endemic—an undoubted fact; and the development of the disease a long time after removal from those places in which it occurs. It may be said, if the disease was of parasitic origin, one might expect a certain period of incubation, but certainly not so long as is recorded of Delhi boil and Aleppo evil, viz., a year or more. We can explain the attack specially of new-comers to a district upon the supposition of its being a constitutional disease, as well as upon the ground of its being a local affair. It by no means follows that because the disease can be cured by the destruction of the new growth described by Dr. Fleming, that therefore the disease is local, for the same happens with scrofulous and syphilitic sores, &c.

Points to be specially attended to in future Investigations.

A.—To define the localities in which the disease and its allies are found, with a view of defining their prevalence.

B.—Pathological cosiderations, viz.: The anatomical seat at the outset; the microscopic characters of the disease *before ulceration;* the nature and origin of the new cell tissue, whether it arise from the rete, the root sheath of the hair or the connective tissues: its exact relation to pus.

C.—Causation. Source and microscopic characters of the water used for drinking and washing; nature of the district, malarial, low, high, &c., in which the disease occurs. The prevalence of flies, musquitoes.

The following would, from what has already been said, appear to be the most important questions to be always specially answered in recording facts relative to Delhi boil and its allies. They may be ranged under two heads. A, as to locality and cause. B, as to the pathological nature of the disease.

A.—*Locality of Occurrence and Cause.*

1. Is the disease observed in your district; what is the name of the place or district; its situation and sea level? Is it a city, if so, the population and its character? Is it malarious? Are there any heavy rains at particular seasons? Is it at all drained?

2. Is the disease endemic or sporadic in the locality? Is there any evidence that it is imported? What is its relative frequency?

3. What are the prevailing diseases? Are ordinary sores, wounds, or ulcerations prone to take on an unhealthy action which *à priori* one is not inclined to expect?

4. The source and nature of the water supply used by the population? The peculiarities as to source or kind in that used by those who are attacked or who peculiarly escape?

5. Are the attacked new-comers; and if so, what is the average duration of residence before attack? Are long residents secure against attack? The age and rank of the attacked? Are water-carriers specially attacked?

6. Are animals attacked, as the dog or the horse?

7. The character of the grain used as food?

8. Do you note the existence of flies or musquitoes in abundance in the neighbourhood?

9. Are furunculi common in the district and among the population, and do they show any differences from those observed in England?

B.—*As to Pathological Nature of the Disease.*

1. The seat of the Delhi sore or boil in order of frequency?

2. Does the development of the disease follow the receipt of injuries or bites, and in what proportion of cases have you observed this? What is the nature and extent of such injury?

3. Describe briefly the first stage and the general course of the disease?

4. What are the microscopical appearances of the boil before ulceration, as compared with those observed after?

5. The nature of the peculiar cell growth observed by Dr. Fleming? The differences of the cells from pus cells? Are there transitional forms between these and pus cells found in the discharge?

TABLE FOR RECORDING OBSERVATIONS RELATIVE TO DELHI BOIL.

Locality. (*a*) Name? (*b*) Situation? (*c*) Malarial? (*d*) A city or not. (*e*) Population, character of? (*f*) Heavy rains at particular seasons.	Is the disease endemic? Any evidence of importation. Relative frequency. Is it epidemic after heavy rains?	Prevailing diseases. Are ordinary wounds prone to unhealthy action? Are furunculi common?	Source and character of water supply of affected portions of the population.	Average duration of residence of the attacked? Are they always new-comers? Occupation of attacked?	What, if any, animals are attacked?	Character of food (grain) of district.	Common seats of the disease? Does it follow injuries? Kind, and frequency?	Early stage of disease.	Microscopical characters of the disease before and after ulceration has commenced.	The nature of the cell growth observed by Dr. Fleming?	Other remarks.

N.B.—Each observer would prepare an enlarged sheet according to this plan and number the several cases in order.

KELOID.

Very little need be said in reference to this disease, because its characters are so very well defined, and there is no reason to think that it is liable to be confounded with any other affections. It must be distinguished carefully from scleroderma and morphœa on the one hand, and fibroma on the other. So-called Addison's keloid is the morphœa before described. We are now dealing with Alibert's keloid.

It is usual to describe two forms, the true or idiopathic; and the false or traumatic keloid or keloid of cicatrices. In true keloid, or kelis as it is termed, but more properly idiopathic keloid, the seat of the disease is not as in scleroderma, the sub-cutaneous tissue, but the corium itself, the morbid change consisting in hypertrophy of the white fibrous tissue of this part, forming a distinct, raised, well-defined tumour; at first pale, and then pinkish and shiny, and oval in shape, possessed presently of offshoots of fibrous tissue like the claws of a crab, which contract and produce distortion. Kelis does not ulcerate, is unaccompanied by enlargement of the glands, and is not destructive to life. There may be one or several growths, and they may be small and scattered. False or traumatic keloid springs up in the cicatricial tissue of all wounds, as after flogging, burns, scars left by rupia, the application of acids, syphilitic ulceration, &c. The disease is simply hypertrophy of the white fibrous tissue with condensation.

It will be interesting to know the circumstances under which keloid occurs in India; with what frequency, in what races, and if there be any real differences observable between the true and false varieties, except in the presence of a traumatic exciting cause in the latter.

The representation, Fig. 3, Pl. VI., page 28, is that of an individual affected with traumatic keloid, or the keloid of cicatrices, and as the particulars connected with the case illustrate the nature of the so-called keloid diathesis, I give them in detail, as reported by Dr. Maury, in the Photographic Review of Medicine and Surgery, a new publication of Philadelphia, from which the illustration is taken. The collar-like growth round the neck is of course most unusual, and altogether an out-of-the-common occurrence. The structural characters are those of a dense and contractile tissue, quite different from the lax pendulous folds of pachydermatocele.

The patient, F. J., coloured, æt. 28 years, was admitted to the surgical wards of the Philadelphia Hospital, 26th May 1870.

When eight years of age a small abscess made its appearance on the anterior part of the neck, which, on being opened, discharged an ounce of pus. As the result of this abscess a well-marked induration followed at the original seat, which gradually extended in both directions around the neck. After nine years' growth it had half encircled the neck, and was about two inches in width. Professor N. R. Smith, of Baltimore, at that time removed the growth. The resulting wound healed kindly in six weeks. The line of the cicatrix, however, was speedily occupied by a hard, rounded ridge, which slowly extended and enlarged. Eighteen months later an accidental wound was inflicted by an axe on the posterior part of the neck. This wound also soon presented a hard, nodulated cicatrix, which crept around the neck to join the one from in front.

His master now carefully avoided punishment, as the least incisions seemed prone to take on this morbid action. Four years after this date a band of soldiers whipped him severely; each gash on healing was succeeded by the hard, elevated ridge, the result of the previous wounds.

Seven years subsequent to Dr. Smith's operation, the tumour was again removed, at which time it had extended round the entire neck. Three months were occupied in the healing of the wound, which also assumed the same morbid action.

At the present time there are 37 tumours of variable size. The large one resembles, in a marked degree, the ruffles worn in the time of Queen Elizabeth, The two original growths are now thoroughly blended and form one solid mass, touching at the posterior part of the neck. It measures 28 inches in its greatest circumference, and five inches in its perpendicular diameter. It is plicated, and has deep fissures separating the folds, from the bottom of which is exuded a thin, yellowish, offensive fluid. The skin is intact, not having undergone ulceration. There is little or no elevation of temperature, no pain when pressure is instituted, the mass being only painful from the weight. The entire mass can be moved without difficulty, thereby indicating only a cutaneous attachment. The sensibility of the skin is perfect, the presence of a fly being at once recognised.

The other tumours are situated on the back and right arm, and vary from the size of a pea to that of a medium-sized tomato.

In July 1870, two of these growths were removed for the purpose of microscopical examination, and also to observe the rapidity of recurrence. For one the ecraseur was used, for the other the knife; in both instances a portion of healthy skin tissue was removed. At this date, almost three months afterward, there is a well-marked tendency to the development of new growths in the same place.

The following careful microscopical examination was kindly made by Dr. L. A. Duhring:—

“ To the naked eye, upon section vertically through the tumour, the cut surface
“ presented a structure close and compact in appearance, of a yellowish-white colour.
“ To the touch it was tough, resisting, and firm, with a certain amount of elasticity,
“ and upon pressure exuded a thin, pale straw-coloured liquid.”

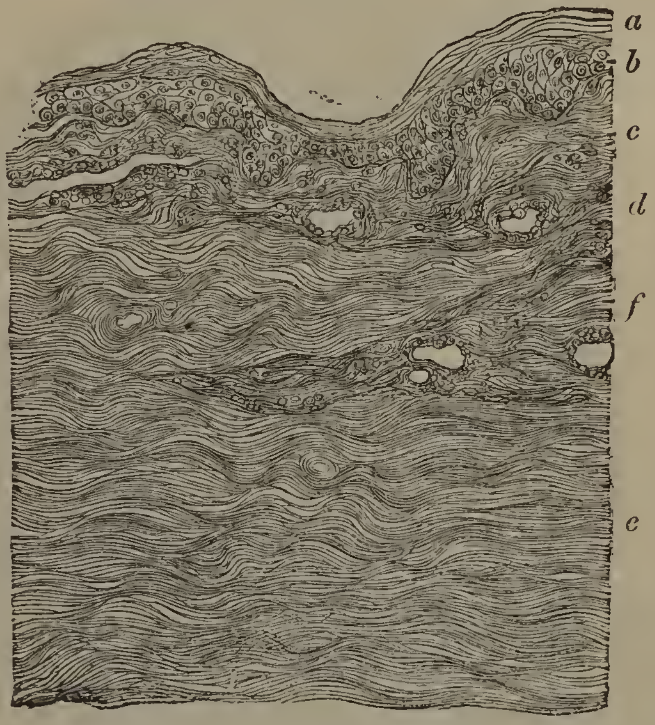
Microscopical examination.

“ After being prepared in solution of bichromate of potassa and alcohol, vertical
“ sections were made and examined in glycerine. The horny layer of the epidermis
“ was thin and scanty, the cells themselves being well broken up, and many of
“ them having undergone granular degeneration. The cells in the upper layer of
“ the rete mucosum seemed closely packed together and unusually numerous, while
“ the deeper layer contained the pigment cells well coloured.

“ The mass of the tumour was composed principally of connective and elastic
“ tissues, the former being disseminated throughout, while the latter appeared here
“ and there in the form of good-sized, well-developed elastic bands, running both
“ transversely and vertically. Fat was found in some parts in fine globules.
“ Long, wavy bundles of connective tissue were seen running in striæ transversely,
“ just beneath the papillary layer. Here and there a cut sebaceous gland was
“ found.

“ In some of the fields a loose network of connective and elastic tissue inter-
“ mingled, was present, with globules of fat. Connective tissue cells, long and
“ twisted, were to be seen, sometimes approximating each other and again
“ scattered.”

The following is a representation from the work of Dr. Neumann of Vienna:—



a. epidermis. *b.* rete malpighii. *c.* tissue of the cutis. *d.* remains of the cutis. *e.* dense fibrous tissue of the keloid. *f.* cell infiltration around the adventitia.

The disease is supposed to begin by cell infiltration about the vessels of the corium; the change in the adventitia being marked especially at the edge of the growth, and at the part at which the arteries send offshoots into the papillæ, says Neumann.

Some special remarks on the pathological analogies and relationship of scleroderma, keloid, and other diseases will be found to follow the description of Fibroma.

The following queries are applicable to keloid:—

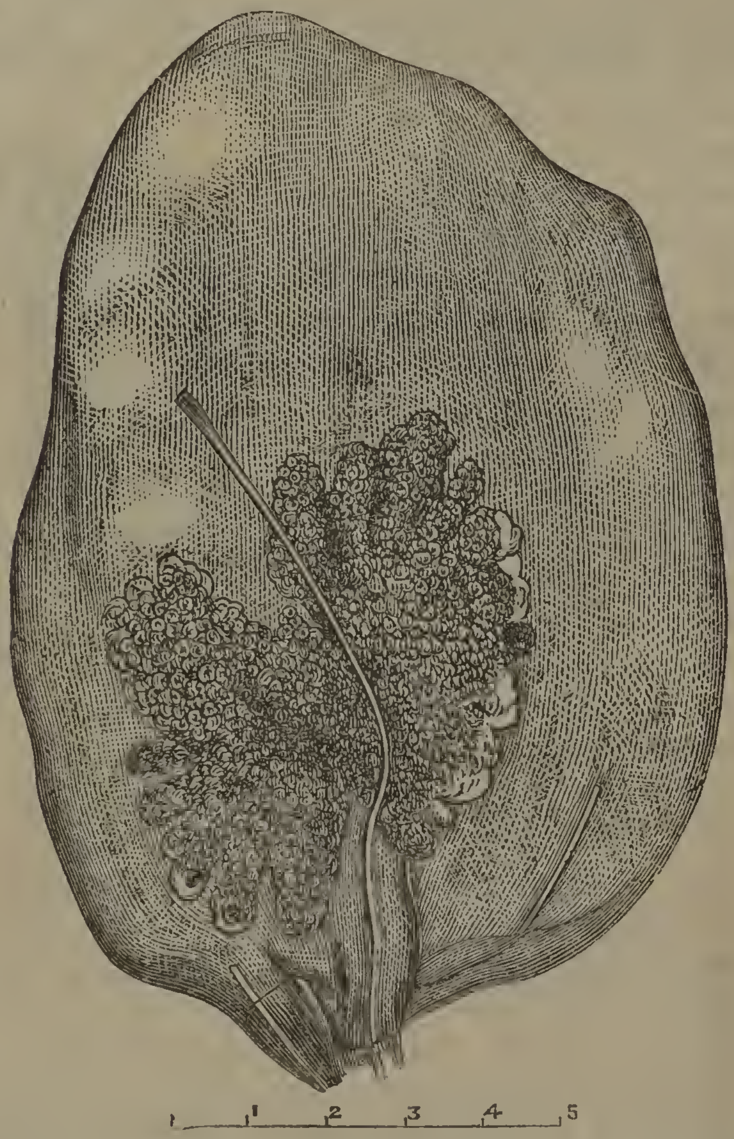
1. Is it observed in your locality, and with what frequency?
2. At what age?
3. As an idiopathic disease or secondary to lesions of the surface, and in what proportions respectively?
4. In what races is it observed?
5. Has keloid any relation to other forms of fibrous outgrowths from or degeneration, of, the skin? Is it found to be associated with the lax pendulous outgrowths of fibroma molluscum or the “scrotal tumours” so common in India?

FIBROMA.

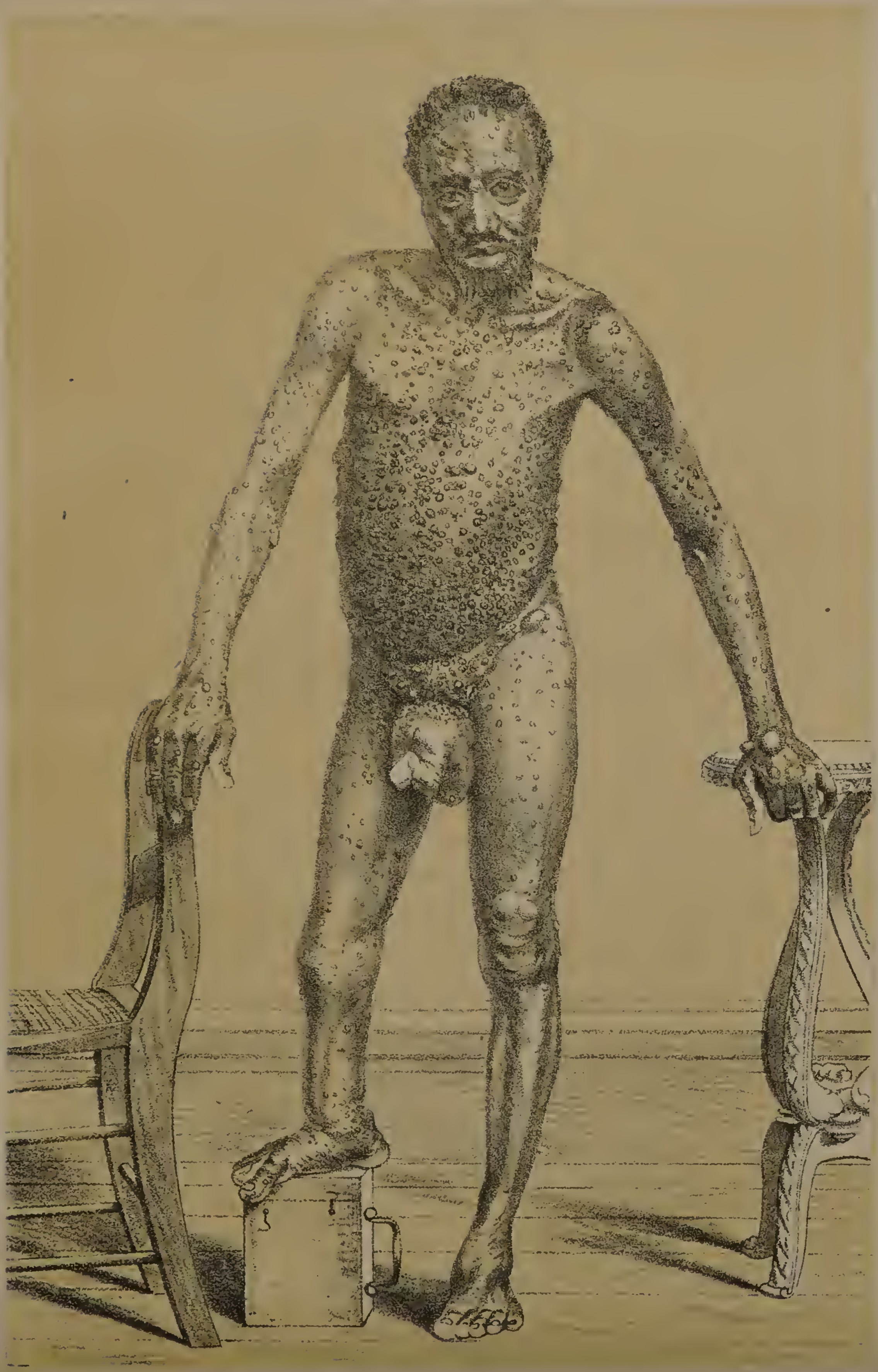
This is called by some writers Molluscum fibrosum.

General characters.—The disease consists in its fully developed state of little outgrowths from the surface, having all the characters of lax integument; they are flabby, generally more or less pediculated. These tumours vary in size from that of a pea to that of a large fig and more. Sometimes the tumours are sessile. These fibromata are soft to the feel, and as before observed have the aspect of ordinary integument, but they are at times corrugated. The neck, chest, back, and more rarely the limbs, are the special seats of these tumours, which occur in elderly people usually. Mr. Wilson accurately describes the feel of these fibromata when he says that " taken between the fingers they often give the idea of a loose bag of integu- " ment, the looseness of the contained areolar tissue permitting of the inner walls " being rolled the one upon each other." These tumours are now and then flattened from the pressure exerted by the clothes. There is no contractibility about the growths as in keloid. The palms of the hands and the soles of the feet are almost always free from the disease. There was a very well-marked case of this form of disease of the skin in the Leper Asylum at Calcutta two or three years ago, we are informed. The accompanying representations, Plate V., sent to me by my friend Dr. Izett Anderson, of Jamaica, give a good idea of the varying size of the tumours and the extensive way in which they may be sometimes distributed over the body. The little tumours look, in the illustration, like those of keloid, but they are to the feel soft, flaccid, and flabby, and unlike the hard dense tumours of keloid.

The Pathology of Fibroma.—The disease would seem clearly to be an hypertrophous growth of the fibro-cellular tissue of the skin, especially that part of it which constitutes the dermic layer of the hair follicle. Dr. Beale settled this latter point as long ago as 1855. (Path. Soc. Trans., vol. vi., p. 313). The mass of the growths on section presents a surface with the aspect of fibrillating material enclosing collections of cells, as shown by Dr. Beale many years since. Mr. Howse, of Guy's Hospital, has lately carefully examined the tissue, and states " that there is not any " particular arrangement of this nucleated connective tissue, except that here and there " it was disposed in bars across the preparation ; these bars were also occasionally seen " in transverse sections as circles, looking something like gland tubes or vessels, from " which, however, they were readily " distinguished by their structure " and the absence of any central " canal." Dr. Beale concluded that neither the sebaceous glands—which might be involved and destroyed—nor the sweat glands were concerned in the formation of these tumours, but that the cells at the deepest part of the hair follicle and of the follicle itself were principally concerned, and Mr. Howse confirms this, and locates the anatomical seat of the disease in the first instance in the two external layers of the dermic coat of the follicle. Dr. Fagge thinks that the sebaceous glands which are involved in the tumours are hypertrophied (see figure opposite from *Med. Chir. Trans.*), but neither Dr. Beale nor others allow this. Dr. Howse says, that in Dr. Fagge's case the glands were more sacculated than usual, and the acini more separated, but this was due to the growth of tissue between them, dividing them one from another.

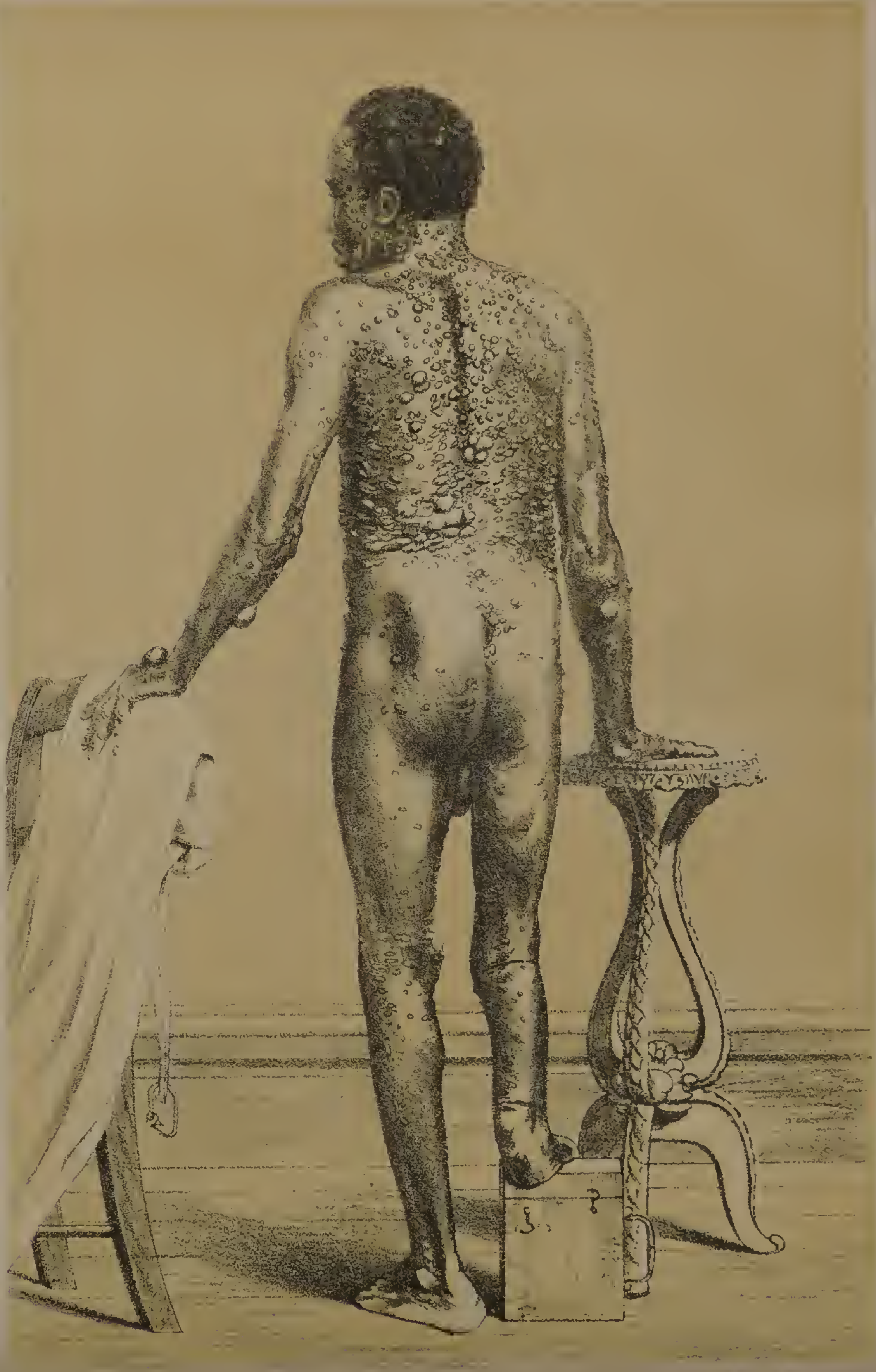


Diseases resembling Fibroma.—There are instances of very lax pendulous outgrowths in which the integuments hang in loose folds, and in which the fibro-cellular tissue is increased, which resemble fibroma, except that the growth is not in distinct circumscribed pedunculated tumours. Valentine Mott called this disease *Pachydermatocele.* Wilson calls it *Dermatolysis.* The hard contractile sessile outgrowths of keloid could not well be mistaken for the lax, flabby, pedunculated tumours of fibroma which have the aspect of normal integument.



Front view

A single tumour



Back view

FIBROMA

to face page 48

The points upon which information is needed as regards fibroma are very few and simple, and may be dealt with in the following queries :—

1. Is fibroma common in your district?
2. At what age, in what sex, and it what races does it occur?
3. Is it ever associated with morphœa, scleroderma, keloid, or scrotal tumours, or the "elephant leg"?
4. Is it distinguishable, in your experience, from keloid by its anatomical seat or by commencing in the walls of the follicle and involving the glands, and by its structure, *i.e.*, by being composed of fibro-cellular tissue in which are loculi enclosing masses of cells, leaving the corium and cutis more or less unaffected, and not, as in keloid, being purely fibrous, originating in the corium, and having much elastic tissue in its composition?
5. Does it appear to follow lesions of the skin?

General Remarks on Fibroid Growths and Degenerations.

There are several of the preceding diseases—in which the changes in the skin apparently constitute the sole disease, and in which alteration in the character and quantity of fibro-cellular tissue is all that is present—that have a close relationship. We are much in want of information as to the relative prevalence of these diseases in India, for some observers have declared that there is a relationship or have tried to trace a resemblance between certain of these fibroid diseases and leprosy. Hebra even hints as much as regards leprosy and fibroma. If there be any connexion between these fibromata and leprosy it should be readily traced in India. European authorities generally disallow any connexion between the same.

A rough glance at the external features of these fibroid degenerations discloses in them a gradational aspect. In morphœa we have the whole derma replaced by a low-typed fibro-cellular tissue, which is not elevated above the natural surface, but which becoming absorbed leaves behind atrophy. In scleroderma the corium and cellular tissue beneath are involved; there is more condensation; distinct hyperproduction of tissue, but as an infiltration with general elevation, and though it would seem that the kind of deposit is much the same, it does not destroy the skin, but becomes absorbed without leading to atrophy. In keloid the corium is specially affected, there is a more distinct outgrowth of fibroid tissue which has a contractile quality about it. In fibroma we have the same outgrowth, but originating about the hair sacs, and of a laxer kind altogether than in keloid, containing more cells in its composition and a less amount of elastic tissue, and this lax form of tissue reaches its climax in dermatolysis.

Then again there is one more relationship to be traced out, if it exist, in the case of fibroma, as illustrated by the patients whose photographs were given under the head of Fibroma. The scrotum in that case was hypertrophied, and presented, says Dr. Anderson, of Jamaica, the same appearance as seen in the common form of Elephantiasis arabum as it occurs in this island (Jamaica). It is heavy, rugose, semi-elastic, and slightly fluctuating to the touch, and if strong and long-continued pressure is made with the point of the finger a slight pit is formed. The orifices of the cutaneous ducts are very much enlarged, and would permit the entry of a fine probe. The penis is affected in a similar manner, and at its root is nearly three inches thick, and the glans is bent at a right angle to its body. This angular condition of the penis was produced only about nine months ago by the patient drawing back the prepuce and being unable to return it, a permanent condition of paraphimosis being thus produced. The prepuce thus reflected is much hypertrophied, and a portion of it is more than an inch thick. On the pubes several tumours exist distinctly defined, and also on the upper part of the scrotum; but lower down they appear gradually to merge into the general elephantoid condition of the part. The fibromata were developed all over the body.

We might conclude from this account that the two diseases, fibroma and elephantiasis arabum (scrotal tumour) were related; but I think that the concurrence of the two morbid conditions admits of another explanation, namely, that the two diseases occurred together accidentally in the same subject. Dr. Anderson further observes that some of the tumours were not lax and pendulous, but others hard and solid, the skin being adherent to the general mass beneath. He further states that, though not all, yet some of the tumours developed in the seat of scratches and cuts, though we are not told whether these were the soft or hard tumours. Dr. Anderson concluded that the case was one of keloid diathesis, he did not appear to think there was fibroma present besides, for he styles the case Multiple keloid tumours ; but if we have the characters of keloid, we have also those of fibroma in certain of the tumours, and those of "scrotal tumour," elephantiasis arabum, also. We give no opinion on this remarkable case, but ask for facts for or against the connexion, *quoad* coincidence or identity, between these fibroid degenerative ailments. We believe true leprosy to be wholly disconnected with them.

AINHUM.

The name "Ainhum" signifies "to saw," and is the term applied to a disease which is said to exist amongst the Africans ; but Dr. Collas affirms that it occurs in India, and for that reason a note is given here. The disease consists of spontaneous amputation of the little toes, with hypertrophy of the amputated part, as shown in the figures given.

Fig. 1.

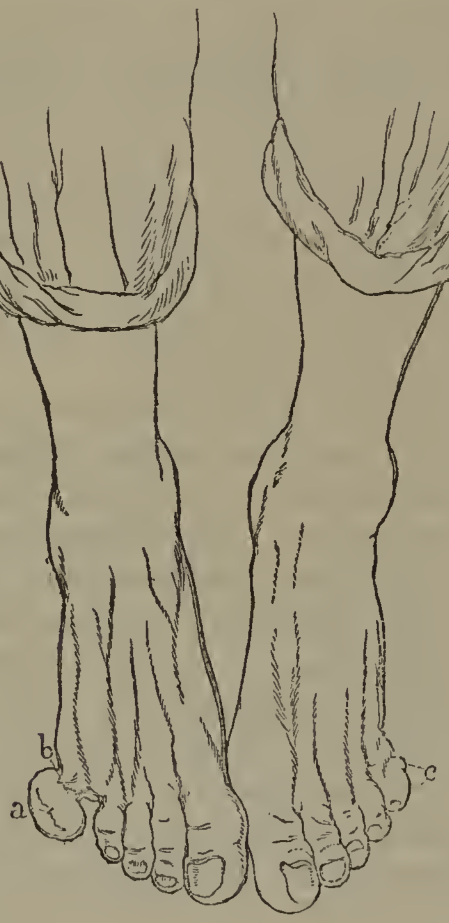


Fig. 2.

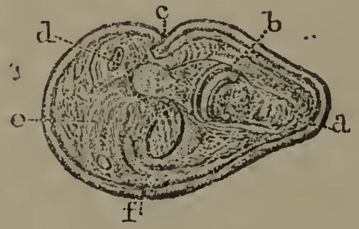


Fig. 3.

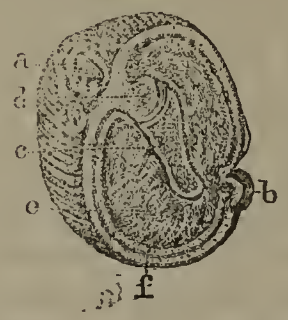


Fig. 1 shows the feet with the appearance of appendages to the little toes, copied from a woodcut in Dr. J. F. Silva Lima's paper in the *Gazeta Medica di Bahia*, for 1867, p. 149.

Figs. 2 and 3 show the appearances presented on section of the appendage.

Fig. 2. *a.* cicatrix of separation ; *b.* joint between terminal and middle phalanx ; *c.* remains of matrix of nail ; *d.* bursal cavity ; *e.* adipose tissue ; *f.* pigment of rete mucosum.

Fig. 3. *a.* ulcer left by amputation leading down to bone *d* ; *b.* remains of matrix of nails ; *c.* ungual phalanx, joint structure unaltered ; *d.* middle phalanx ; *e.* adipose tissue of ball of toe unaltered ; *f.* thickened cutis and rete mucosum.

A small semicircular furrow first appears in the digito-plantar fold, which gradually increases, without pain or inflammation, the toe enlarging twice or thrice its size, and getting loose and in the way. If the toe is cut off, the wound left heals very speedily. The cause is unknown. The general health does not suffer. The disease is symmetrical. The amputated toe shows fatty change of the tissues, enlargement of the areolar spaces of some of the bones of the phalanges, the bone tissue between the middle and proximal phalanges being replaced by fibrous tissue, the separation of the toe taking place at the proximal inter-phalangeal joint and not the metatarsal phalangeal joint : the cartilage and articular end of the middle phalanx being removed and replaced by fibrous tissue, which looks like an ordinary cicatrix. Information relative to this disease is greatly needed.

ELEPHANTIASIS ARABUM.

Syn. Elephant leg, Bucnemia tropica, Barbadoes leg ; called also by Erasmus Wilson, after Mason Good, and so named in the Museum of the College of Surgeons of England, Spargosis.

Nomenclature.—There is a very unhappy confusion in the use of the term Elephantiasis at the present time. Most Indian officers, when they use the term "Elephantiasis," refer to the elephant leg, whereas in Europe, dermotologists signify thereby true leprosy, or Elephantiasis Græcorum, as distinguished from Elephantiasis Arabum, and the term is so used in the new nomenclature of the Royal College of Physicians. We may ask our Indian brethren not to use the term "Elephantiasis" without qualification, but to append to it the additional term Arabum when the "elephant leg" is meant, and "Græcorum" when true leprosy is signified. Much confusion will be avoided hereby. The use of the term Bucnemia tropica, or "tropical big leg," and when the disease attacks the scrotum, "scrotal tumour,' would banish all confusion, and is to be commended, so as to get rid of the word elephantiasis altogether. Leprosy being called leprosy.

Description of the disease.—It is scarcely necessary to give a description at any length of a disease so well known. The disease usually attacks the lower limbs and is mostly confined to one, but may affect the scrotum, belly, breast, pudendum, and other parts. It is characterised by hypertrophic growth of the cellular tissue of the skin, giving rise to general enlargement and alteration in the aspect of the skin, so that it becomes tawny, hard, dark, livid, thickened, often scaly, and perhaps fissured, whilst by and by warty points appear, so that the skin looks and feels like that of an elephant. The general swelling results as the direct consequence of attacks of inflammation of the lymphatics, each attack being accompanied by "fever," increased swelling of the affected part, which does not subside with the disappearance of the lymphatic inflammation, but remains as a permanent increase of the disease. The malady consists of an hypertrophic state of the derma and the subcutaneous cellular tissue, both of which are infiltrated by a fluid rich in fibrine; the lymphatics being obliterated and the veins obstructed.

Points to be noted.—The circumstances under which the disease occurs, in reference especially to the question of cause which is believed to be malarial. The intimate connexion of the disease in its development with attacks of "fever" is remarkable, but more information is needed as to the nature of this fever. The habit of "squatting" in the damp is blamed in Bengal for predisposing to scrotal tumours. But this, together with malarial fevers, are so universally prevalent that we may perhaps look to other influences as the true cause of bucnemia tropica.

The following queries seem all that are necessary to be put forth here:—

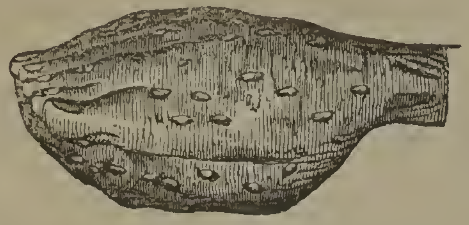
1. Is the disease common or not in your district? Is it sporadic or endemic? Does it occur in residents and natives of the place?
2. The sex, and occupation of the attacked? The part of the body attacked?
3. Is the district malarial?
4. Character of the water supply as regards organic matter, especially such as is used by the attacked?
5. Do febrile attacks always precede the onset of the local swelling or its augmentation, and is the latter proportionate to the frequency and severity of the febrile attacks? The nature of those febrile attacks?
6. Do keloid and fibroma ever co-exist with bucnemia tropica or scrotal tumour, in your experience; and if so, with any frequency?

MADURA FOOT, OR FUNGUS FOOT OF INDIA.

Synonyms.—The other terms applied to the disease are Mycetoma, signifying the causation of the malady by a fungus; Ulcus grave; tubercular disease of the foot; Morbus tuberculosis pedis, and Podelkoma.

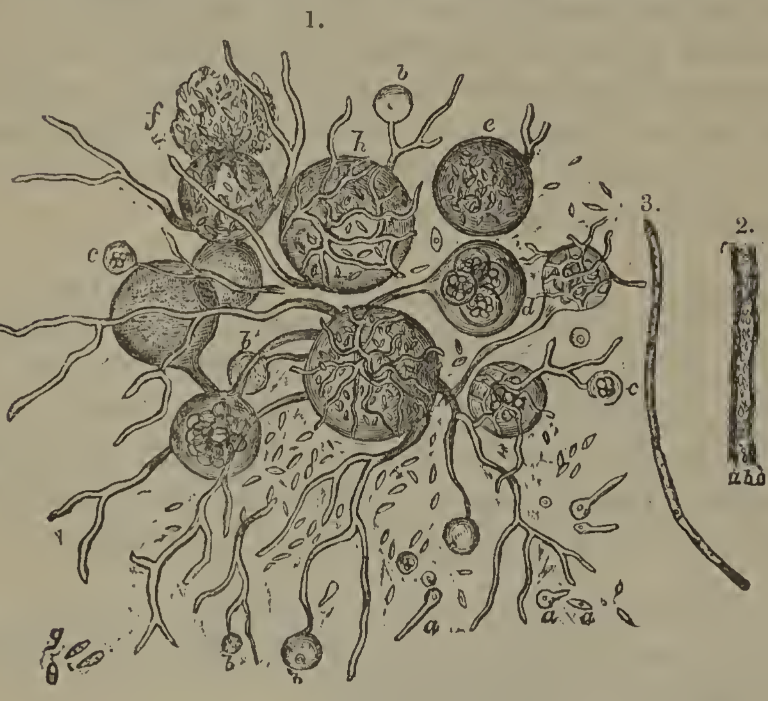
Description and general remarks.—A good deal has been written and said about this disease, from time to time, by Eyre of Madras, Ballingal, Bagunjee Rustomjee, Day, Vandyke Carter, Minas, W. J. Moore of Rajpootana, and Dr. Bidie, and sufficient to make us well acquainted with its character. Dr. Carter was the first to discover a fungus in the disease, and to suggest that as the cause, but it is difficult to gather from his writings in how many instances he has detected the fungus; and other Indian officers, save Dr. Bidie, do not appear to have met with it. We have had the opportunity, through the great courtesy and kindness of Dr. John

Shortt, of Madras, of carefully examining several excellent specimens of the disease which he has sent home, and have in only one case detected the fungus. The disease when fully developed consists of marked swelling of the affected part, generally the foot, though it may be the hand or the shoulder even, it is said, which is studded over with little soft buttony elevations about the size of a pea, having a central aperture leading into a sinus. The buttony enlargements are studded over themselves with little black grains or masses like fish-roe, which also collect about the openings of the sinuses. From the sinuses are discharged black and white particles, with thin sero-purent fluid. The accompanying representation gives some idea of the appearance presented by the foot attacked by the disease.



Now if we make a section of a diseased foot, what do we find? Dr. Carter thus sums up the appearances :—" General confusion of parts owing to absorption of the " bones and fibrous thickening of the soft parts; often the presence of granules, sepa- " rate or aggregated in mulberry-like masses of a yellow or brown colour, lodged " in spherical cavities excavated in the bone or in the soft parts, or in tunnels or " channels leading from the cavities to the apertures on the surface, also lined by " membrane. These granules are " present in the discharge; some- " times there is a deposit of " fleshy (may be reddish or dark- " coloured) substance, contain- " ing numerous minute particles " (white or red) and occupying " the same localities as the above- " mentioned granular deposit. " Lastly in the same localities " we find black granules, sphe- " roidal tuberculated masses of " the same colour, radiated in " structure, which have been " mistaken for melanosis or blood " clots." These black masses are the fungus. The accompanying is Dr. Carter's description of the red fungus.

Chionyphe Carteri, from Dr. Fox's Work.



The original drawing of Carter reduced to $\frac{1}{4}$.

1. *Red Fungus* which grew on the surface of the fluid covering the portions of a foot affected with the "Black Fungus," magnified to show its development from the germinating sporidia, *a*, *a*, *a*, to the formation and bursting of the spore *f*.

a, *a*, *a*, *a*. Germinating sporidia. *b*, *b*, *b*. Commencement of spore-cells containing nucleus. *c*. Nucleus and contents of spore-cell further advanced. *d*. Apparent quadruplication of contents of spore-cell with further subduplication of their interior. *e*. Spore and sporidia formed. *f*. Spore bursting. *g*. Sporidia more magnified to show shape and nucleus. *h*. Spore embraced by a condensation of small filaments, very common, if not constant.

2. Felt-like form of the layer of Red Fungus as it grows in the bottle. *a*. Filamentous layer. *b*. Layer of spores. *c*. Filamentous layer below.

3. Filament to show that it is composed of cells with a nucleus in the upper end of each.

Filaments $\frac{1}{5400}$ in diameter; sporidium, $\frac{1}{5400}$ long.
Spore, largest piece, $\frac{13}{5400}$ in diameter.

We can quite confirm Dr. Carter's description as applicable to certain cases, but we have very carefully examined other specimens in which there was one feature entirely wanting, viz., the presence of the black granules and masses in the spherical cavities, all else being the same, even to an abundance of roe-like particles. Such a specimen we presented to the Pathological Society of London on the 19th October 1870, and it was referred for a detailed examination and report to Dr. Moxon, Mr. Hogg, and ourselves. We very carefully examined the foot and made the following report :—

" The soft parts of the foot are swollen; but the muscles are degraded and wasted, so that it is difficult to recognise them. The swelling arises partly from increase of the subcutaneous fat, and partly from the size and numbers of the canals. The several tissues are traversed in all directions by these canals, which branch and intercommunicate. The bones as well as the soft parts are pierced by them, but the tissue of the bone, even close to the walls of the channels, is quite healthly looking. The walls of the channels are composed of a soft greyish filmy substance, continuous with and not separable from the tissues around. Microscopic examination does not reveal any structure in this substance, except a few fibrils and a defaced nucleus here and there. The contents of the channels are not connected with their walls. They correspond to the descriptions of fish-roe-like substance which is described as filling these canals in the second form of fungus foot, except that they do not show any pink colour . . . There was no trace of structure that could be set down as that of fungus. The cells and fibres that Dr. Carter has described in the black matter of his first form of fungus foot we could not see any sign of. His opinion that the rounded bodies composing the fish-roe-like substance are made up of defaced fungus structure, coated with fringes of fat crystals, may be correct; but we must remark that if so, the defacement of the fungus character is curiously complete. On the other hand, these rounded masses (*see* Fig. 1, after Carter, natural size, colour, and appearance; Fig. 2, one of the masses magnified, ½-inch object glass), with their covering of subfilamentous material, have a very uniform appearance, such as suggest to us a less accidental nature than that attributed to them by Dr. Carter. The substance of the little rounded masses is softly granular, and has in some instances a texture of fine fibrils in it, like those of coagulated fibrine. The surface of each mass is rounded and its curve is perfect, but we cannot see any nuclei or cells upon it. The sub-filamentous material presents at first sight the appearance of a ciliated epithelium, as its component matter gathers itself into masses about the size of the cells, and these masses will separate and float about, but in them, when separate, there is no nucleus to be seen, but only faint fibrillation; in some instances these filaments are separated from each other. They are not acted upon by acetic acid, caustic soda, or potash of moderate strength. The filaments bend in a wavy manner, and appear entirely devoid of rigidity such as characterise crystals (*see* Fig. 2, above).

Fig. 1.

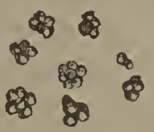
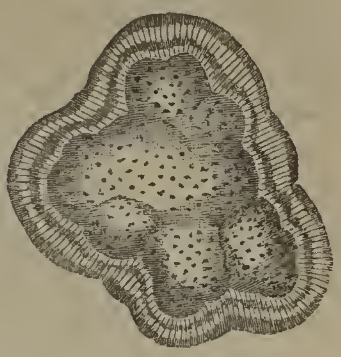


Fig. 2.



"We are of opinion that the nature of these remarkable structures requires further investigation, directed rather to their stages of development or of further transformation than to their minute structure. We think that their very constant and peculiar form, and especially the sub-filamentous covering of them, marks them as something more definite than perished fungus."

In a second specimen of the disease which we still more recently exhibited to the Pathological Society of London, black masses in abundance were present in

Fig. 3.

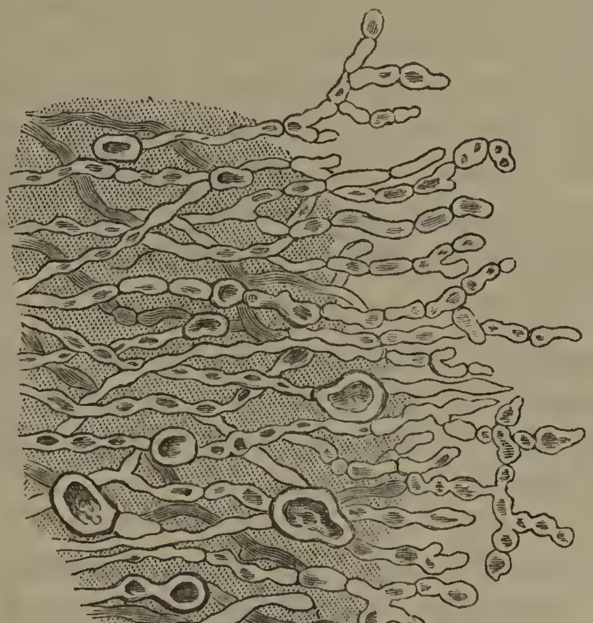
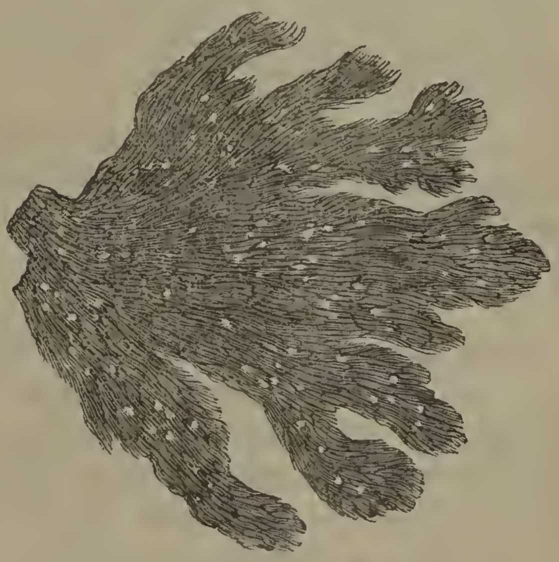
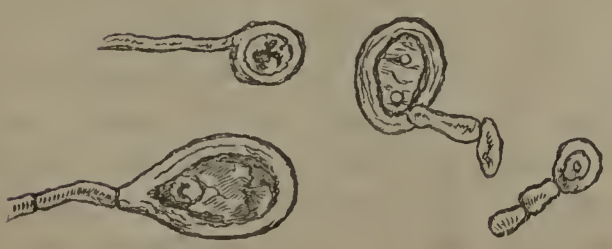


Fig. 4.





loculi in the foot, and these black masses were carefully examined by Dr. Bristowe, and found to be made up of fungus elements, having the characters of oidium. Fig. 3 is Dr. Bristowe's representation of the fungus as he saw it after boiling in potash; Fig. 4 gives the appearance of a piece of the black masses magnified 10 times. Fig. 3 is one of the terminal points of Fig. 4, magnified 420 times. There still remains the fact that in one specimen where the foot was disorganised there was no fungus at all. So that after all it may be that there are two aspects of the disease, one in which fungus is a complication, and the other in which it is absent.

The most striking difference between the two phases of fungus foot would appear to be the absence in one of the loculi (above and beyond the channels) filled with black truffle-like mass of fungus. The similarity is the perforation of the whole tissues by channels giving out the fish-roe-like masses. The question suggested here is this: Is the presence of the fungus an accidental phenomenon; and does it find its way through the sinuses running from the surface, and there luxuriating, develop for itself by its growth, loculi in the tissues? To determine this we need to learn the appearance of fungus foot in its earliest condition. But there are one or two points to be still further considered in regard to the appearances presented by the fully-developed disease.

Absence of black matter.—It does not follow that because we in England have found no black masses in certain cases, that they may not have existed to some extent in specimens prior to their being sent to this country; for in the instance which Dr. Moxon and we ourselves examined, and in which no trace could be found, black matter was discharged from the sores in the foot before it was amputated, so we were informed, and when the amputation was performed it was noticed that "the "medullary part of the bones just above the ankle was infiltrated with a black "fluid, the disease having extended up into the tibia." The nature of this black matter is uncertain. Is it fungus or blood, because some is certainly altered blood, and blood is sometimes discharged from the openings in the foot? And this leads to another very important point.

State of the bones.—In some cases where the disease has appeared to be confined to the bones of the foot, and where no sign of disease has existed in the integuments of the leg, it has been noticed that when the leg has been amputated just below the knee, "the bones were unusually soft and yielded readily to the "saw," and it is in such cases that grumous black fluid is found infiltrating the medullary substance of the bone shaft upwards towards the soft part. In other cases this accompaniment of the disease has not been observed. We especially refer to Mr. Wright's observations in the Guntoor district. The condition of the bones themselves is sometimes simply that observed in an ordinary case of necrosis. There is a fine specimen in University College Museum of the entire bones of the foot illustrating this point. In other cases the bones in part are affected about the neighbourhood of the joints; and in others, the bones are shelled out completely in parts, forming the walls of cavities enclosing black masses. Sinuses always lead down to the diseased bones.

Joints and cartilages.—In those cases which we have seen, it has been observed in tracing the disease upwards from very diseased joints to joints commencing to be affected, that the articular surfaces about the ligaments were chiefly affected. Whether this is always so in the early stage remains to be proved.

Antecedents as regards attack of Guinea-worm disease.—There is one point which it is well to refer to before inquiring how all this disease originates. And it is the frequency with which patients suffering from fungus foot have been previously attacked by guinea-worm or some similar affection. In the notes of one case sent by Dr. John Shortt, from Mr. Wright of Guntoor, it is said that "there was an old "cicatrix in the growth of the middle of the skin and a small fistulous opening on "the outer side of the calf of the leg, half way up. He had previously suffered from "guinea-worm." The idea that often strikes one in examining a section of a fungus foot is, that some entozoon must have been at work to produce the channels which riddle the foot through and through, and that it is unlikely that a fungus growth could produce such appearances as are seen in fungus foot, but that it may readily lodge and luxuriate in the channels already formed. The peculiar fish-roe-like bodies have given rise to the surmise that they may be the ova of some entozoon. The point is worthy of close attention. It is different from anything we know at present, we may say, to find a fungus deeply penetrating solid tissues, channelling out sinuses, piercing bones, and producing necrosis, with destruction of joints, cartilage, and ligaments.

Mode of origin and cause.—How does all the disease above described arise? This is a most important question indeed. We are told that Mr. Bagunjee Rustomjee (Dr. Carter's paper), found "in the early stage little or no swelling of the foot; " the integments are natural in colour, or slightly congested and hot, having in the " surface elevations, which when burst or opened, allow a thin yellowish puriform " discharge to exude, containing granules like poppy seeds. The skin in the " plantar surface is irregularly thickened, and converted into knots at intervals, and " gives, on handling, the feeling of lumps." Another surgeon says, "the disease commences by small irregular and somewhat painful swellings on some part of the " foot; it slowly increases, suppurates, bursts, or discharges a thin purulent matter." Mr. Moore, Rajpootana, says, "when the black variety of the fungus is present the " skin has a blue mottled appearance;" and again, "it appears as a small nodulated " swelling, presenting black particles beneath the integument, as if gunpowder or " Indian ink had been pricked into the foot." The fungus in the latter case is supposed to find entrance to the skin by a wound, as from a thorn.

We have the history of four of Mr. Wright's cases. In one, "about ten years " before the patient noticed a small boil or pimple on the sole of the right foot near " the toes; a few months after others appeared, but no further change occurred for " eight years, that is two years ago," when the whole foot swelled and became painful, and discharged a blackish matter. In the second case, the man "noticed " two years before a small pimple on the sole of the foot near the smaller toes, " which came into an open sore. Other sores then appeared and the foot swelled " generally with discharge of black matter." In case three, the man "noticed a " small blister on the inner side of the left foot, when the ankle began to swell and " sores broke out in different parts of the foot, discharging a glairy fluid and blood, " but no black matter it seems." In the fourth case, about 18 months before admission, he "noticed a small sore between the big and second toe of the right " foot; the toes then began to swell, fistulæ formed." Mr. Minas noticed in the case of the hand the first appearance to be a bluish discoloured swelling.

Now it will be observed here that we have no proof that the surface disease is not an evidence of deeper-seated disease—we do not affirm it is; but what we want is a careful examination of a whole foot when the early stages above described are present, to ascertain what is the condition of the deeper parts; for it will be remembered that we stated just now, that very serious disease of bone may exist, to be discovered during amputation, for instance, when no evidence of its existence is afforded by the condition of the soft textures covering it. If the disease begins from without, and travels inwards, and is produced by an external cause, then in the earliest stages we should find the deeper parts healthy and the superficial parts affected in the way above described, and we must be able to trace the progress of the disease in more advanced cases, from without inwards. It is clear that a serious amount of disease of the bones may exist without giving evidence of its presence by external appearances, and it has yet to be actually disproved, that when the sinuses form, and then open on the surface, this is not the result of serious deep disease primarily affecting the bones and the joints with their component parts. This point demands careful attention. It does not appear that the discharge in all cases is necessarily black, or that it must contain black granules, for it may be it seems very purulent. The microscopic characters of the discharge, and of the black granules, especially those imbedded in the integuments at an early date, demand special attention.

From what is known of fungi generally, we conclude that such free development of fungus, as is sometimes found in Madura foot, does not take place unless in situations to which the air has free access, or in other words, under conditions in which a fungus can readily gain access from without to the locality in which it grows. That a fungus can first find its way to the skin, and through some wound, and then be closed in by the healing process, lie dormant a certain time, and then rapidly develop, is not to be expected. We should anticipate that there would be an uninterrupted communication between the external air and the locality in which the fungus develops, but our ideas may have to be modified. At any rate, we ought to be able to trace the first stage of the disease before the existence of free channelling through the tissues caused by the luxuriating fungus; for granting the existence of channels, we can readily explain the presence of the fungus as a frequent accidental phenomenon; we ought therefore to trace the earliest stages in order to determine whether the disease is due to the attack of a fungus.

There are no doubt certain considerations that lead, in some cases at least, directly to the inference that the disease is caused by a fungus. The receipt of wounds which subsequently become, as asserted, the seat of fungus growth, the free discharge of masses of fungus during the progress of the disease, and apparently *from the moment of formation of the sinuses*, the formation of the sinuses being apparently dependent upon the free growth of the fungus masses, the existence of black nodular swellings before any sinus has formed, the large amount of fungus found in the disease sometimes, the infiltration of the bones by a black fluid in the seats of the advancing disease, a fluid *supposed* to contain fungus and the occurrence of the disease in an unsymmetrical form and in a part of the body specially liable to come in contact with moulds of various kinds in the cotton fields, and the like. But yet it may be shown that very serious disorganisation may exist without a particle of fungus. It is on this point we want more evidence.

Points to be specially attended to.—These have been pretty clearly indicated in the preceding remarks. The first is, are there two distinct forms or aspects of fully developed fungus foot with extensive destruction of bone and tissue, but the one with and the other without the truffle-like masses embedded in loculi and tunnels? and if so, then this would go very far to show that the disease was non-parasitic, but only complicated more or less frequently by fungus growth which excavates for itself loculi? In order to determine this question, we want, secondly, exact information as to the constant appearance seen at an early stage, and on section of the deeper parts before the formation of actual sinuses opening upon the surface, which would enable us to determine whether the *deep* parts or the *superficial* parts are *primarily affected*, the skin and the subcutaneous tissue or the cartilage and medulla of the bones; in other words, whether the disease travels from without inwards or *vice versâ*. Thirdly, we want information regarding the minute character of the discharge as it *first* comes from the openings that appear on the surface, and of the small black particles that stud the integuments in an early stage, with a view to show whether fungus is present at the early stage, or only appears shortly after the fistulous openings occur, and also the power of the fungus to "bore" into the integuments. Suppose we do find fungus present at an early stage, and superficially placed with sinus, it may even then be accidental; and therefore the real point to determine is the second; that is to say, to disclose the existence or not of deep disease first of all without fungus; or the origination of the disease in the superficial parts, and its travelling from without inwards, in connexion with the presence of fungus elements. We append a form for "case-taking," in the observation and recording of cases, which seems to us most likely, if adopted, to secure the information needed.

MADURA FOOT, OR FUNGUS FOOT OF INDIA.

(Table for recording cases.)

A.—CLINICAL FACTS.								B.—PATHOLOGICAL OBSERVATIONS.		
Number of case? By whom recorded? In what district? Date of observation.	Name, Age, Sex, Diathesis.	Employment in cotton fields, or swampy or damp places? Race and peculiarities? Are the feet of attacked habitually exposed?	Antecedents as to wounds directly followed by the disease, or as to prior occurrence of guinea-worm disease?	Is the disease symmetrical or unsymmetrical? What part of the body attacked?	First symptoms as stated by the patient? When did they occur, and what was the order of their sequence?	First signs as observed by the medical man from personal knowledge, and date of duration of disease up to time of present record.	Describe briefly the condition of the diseased parts.	Give the microscopical characters of— (*a*) The black specks in the skin. (*b*) The discharge at the earliest period when the sinuses first open on the surface, and subsequently noting any differences. Are the black specks present in all cases? N.B.—The character of the discharge at different periods is important.	The appearances on section of the diseased part in reference to— (*a*) The nature of the small discoloured nodular elevations that exist before the formation of sinuses, when such elevations occur. (*b*) The general aspect of the parts, whether it is true that in some cases there is free channelling through the tissues and bone, with great disorganisation, and free collection of fish-roe-like (white) grains, but not dark granules or masses in loculi, or large excavations filled with truffle-like masses. (*c*) The presence of a black-like fluid in the bones about the joints in the site of extending disease, and its nature (see next query). (*d*) The state of the joints and ligaments, and cartilage in the earliest stage of disease. (*e*) The condition of the bones in parts unconnected with channels. (*f*) The existence of black matter in parts absolutely without communication with the external air, as contrasted with parts directly communicating through sinuses with the exterior?	The microscopic characters of— (*a*) The fish-roe-like masses. (*b*) All black granules. (*c*) All black fluid, as showing that it is fungus or altered blood?

N.B.—The ninth column contains queries referrable to the discharge at different periods; the tenth to the minute changes in the diseased part; and the eleventh to the nature of foreign bodies. The object being to determine whether the general disorganisation of the fungus foot, that is to say, the infiltration of the tissues, the bone disease, the channelling of the tissues, &c., may be present without the fungus itself.

LEPROSY, OR ELEPHANTIASIS GRÆCORUM.

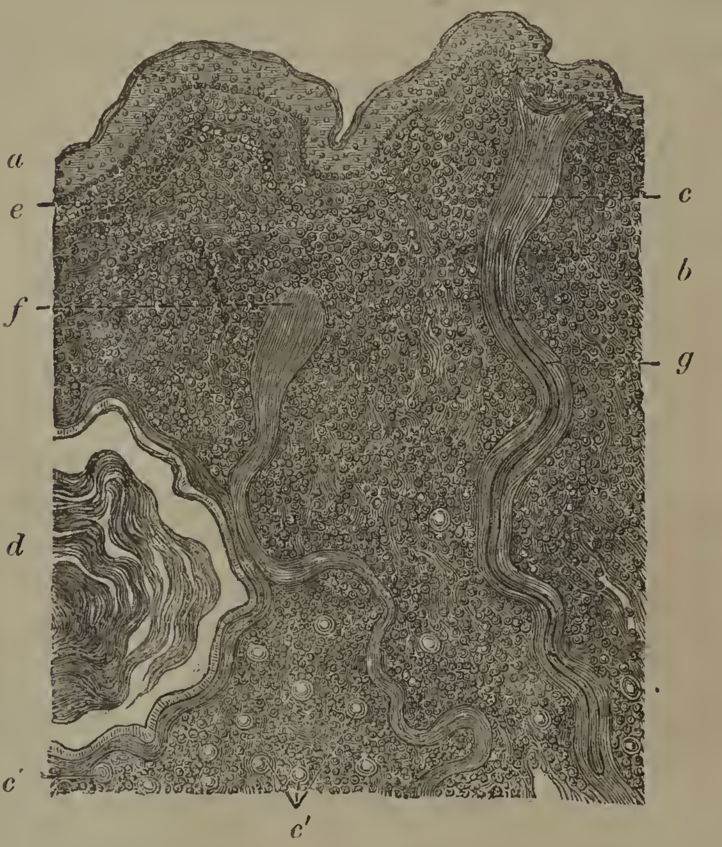
The Report on Leprosy issued by the Royal College of Physicians, and compiled from answers received from all parts of the world, has made us more perfectly acquainted than we hitherto were with the characters, the course, and the varieties of leprosy; and it has confirmed the prevailing opinion that leprosy exists in two principal forms, the tubercular and the anæsthetic, and that these are the same all over the world, with the exception that the one prevails more plentifully in one than another district. The pathology of the disease is fairly understood.

The accompanying figures, Plate VI., illustrate the features of leprosy. Fig. 1 is an eastern picture of a leper. Fig. 2 represents the face of a native of Jamaica, with well-marked tubercular leprosy. The illustration was sent to me by Dr. Izett Anderson of that place.

In the disease a granulation tissue is found deposited in the integuments and in the fibrous textures, and about the nerves and at times the nervous centres: more plentifully, and particularly in the nerve structures of the body in the anæsthetic, and in the skin and mucous surfaces in the tubercular form, a circumstance that sufficiently explains the peculiarities of the two forms.

Neumann has given an excellent illustration of the minute characters of a leprous papule. We give his figure, for the use of which we have to thank Dr. Puller.

Neumann found the papillary body elevated, the cutis thickened, the normal tissue replaced by minute cells, slightly expanded by acetic acid; so that in some parts there only remained a slight amount of normal tissue. The fat goes. At first it seems there are colloid cells in the corium, then aggregated colloid globules, and then the small cells infiltrate the whole cutis. Many observers believe the new growth begins about the hair follicles, and take the form of strands. "There is a continual production of small rounded "cells, between which the intercellular "substance becomes gradually more "scanty, so that between the cells "(arranged in groups and rows) are "seen only narrow strands, of somewhat striped substance, the nuclei of "which are rendered opaque by acetic "acid." In fact the cell growths invade the fibrous textures gradually to more or less defacement of them.



a. is the epidermis and rete. *b.* cutis with cell infiltration. *c.* groups of colliod granules. *c'.* colloid globules. *d.* disorganised and dilated sebaceous glands with accumulated contents. *e.* coiled hair follicle with atrophic hair. *f. g.* sinuous connective tissue strains, formerly hair follicles (?).

But the cause of leprosy is as obscure as ever, and upon this particular matter the "Leprosy Report" gives us very little satisfactory explanation, beyond illustrations of the general statement that leprosy disappears *pari passu* with an improvement in the hygienic condition and diet of a people, and the cultivation of land in districts where it has abounded.

It is especially with a view of seeking information and promoting the collection of facts, touching the immediate cause of leprosy, that the following observations are offered. We have enjoyed unusual opportunities of seeing leprosy in its native haunts, and also have had many cases under our care in this country, and have paid no little special attention to the disease, so that we speak from a practical acquaintance with the disease and its surroundings.

Now in estimating the cause of leprosy we must be very careful to distinguish between its *production* and its *propagation.* This distinction is a vitally important one, for we may have leprosy merely *propagated*, and that extensively, in certain districts and under conditions, whilst we attempt to seek for its *origination* in the action of some malarial poison, or some peculiarity in the food of the people, or something outside the individual, and are so led completely astray and to wrong inferences. We might, in discussing for example the explanation of the cause of

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Plate II

Fig 1

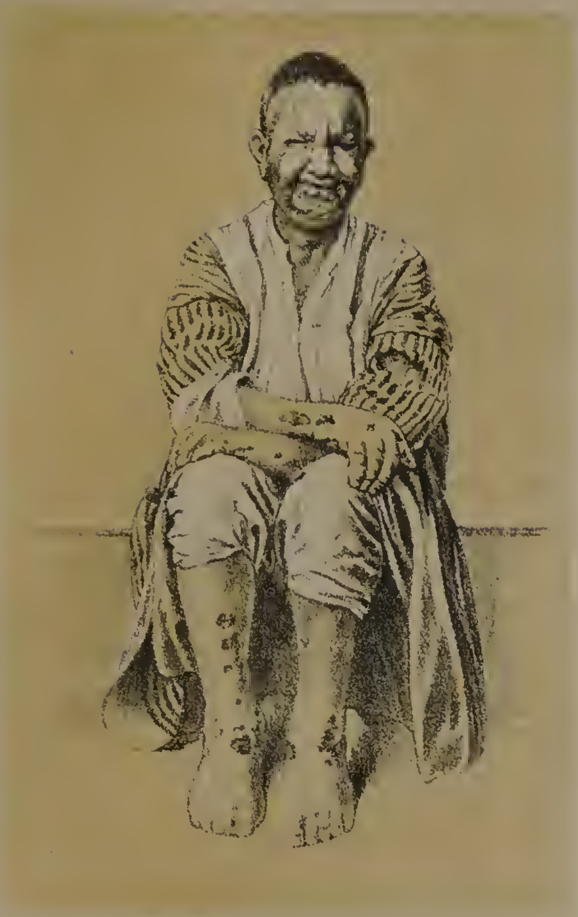
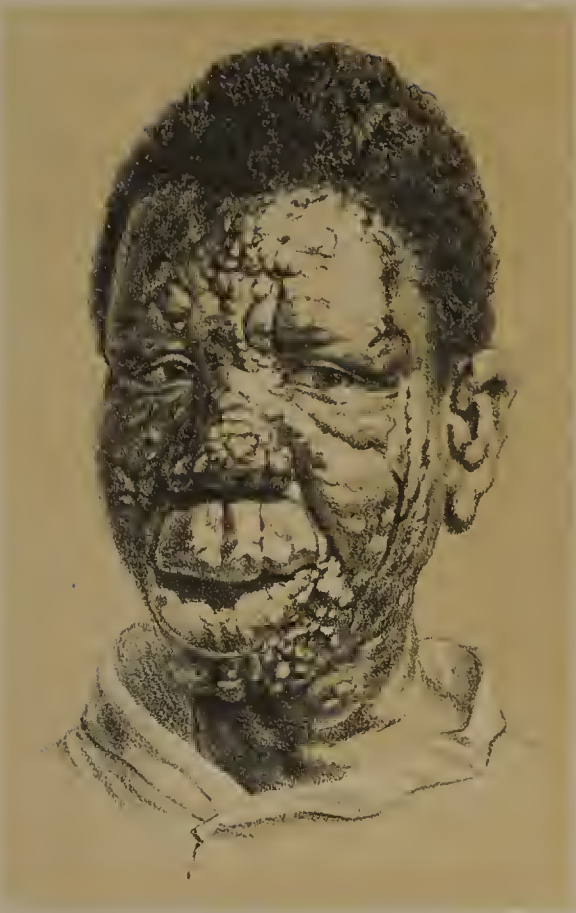
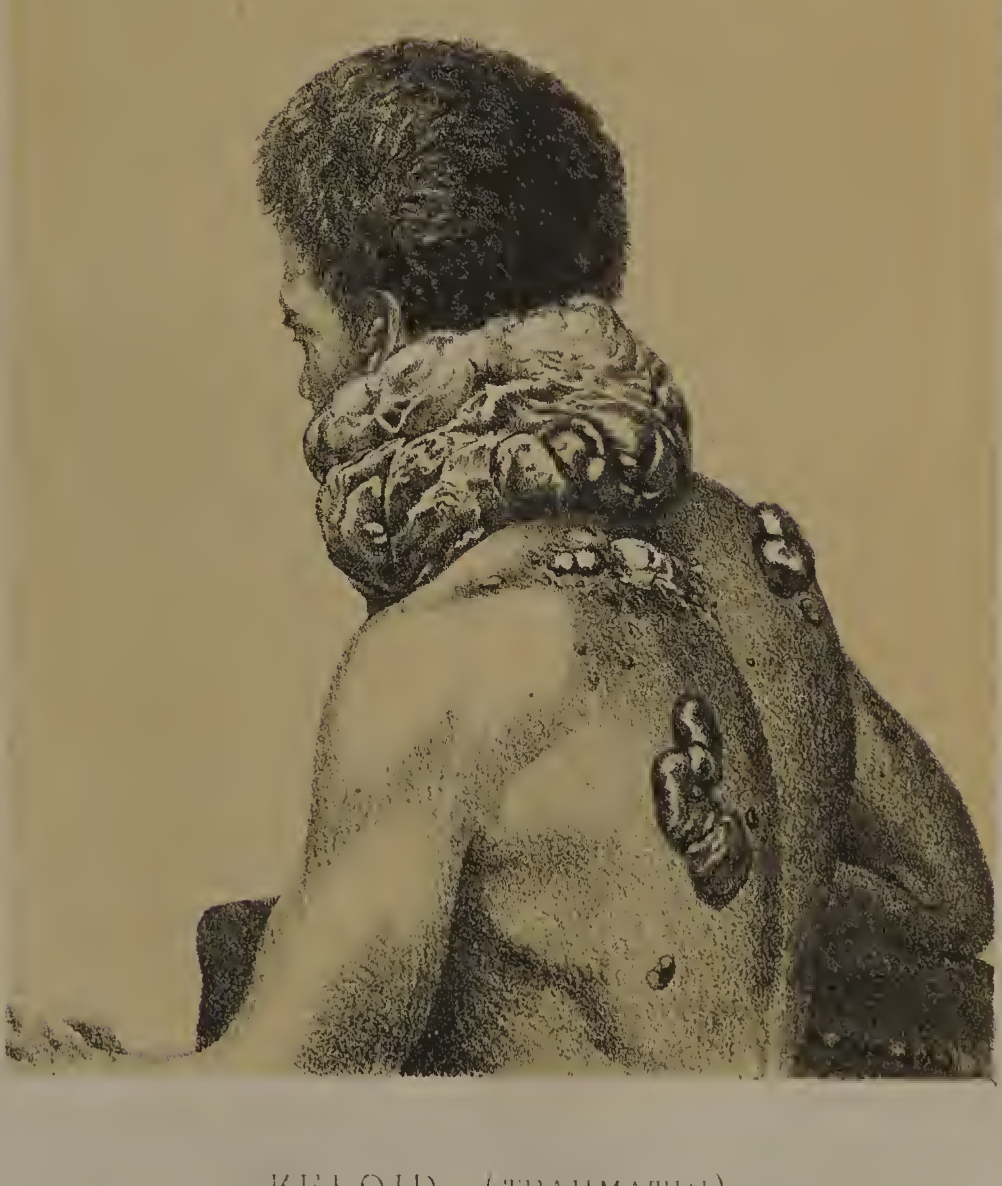


Fig 2



LEPROSY

Fig 3.



KELOID (TRAUMATIC)

leprosy in the fish-eating habit of the people of a certain locality, argue that this could not be the *cause* of the disease, because the habit was not observed in other districts where the prevalence of leprosy is common; but then leprosy might really be accounted for in these places by importation, or by the intermarriage of lepers or the leprous with the healthy. In fact, we might very erroneously come to reject a peculiarity of life or diet as an element in the causation amongst certain leprous communities, because it is not operative in other cases where the presence of the disease is really to be explained by hereditary transmission or importation. We have no doubt that in Syria the leprosy is mainly propagated by the intermarriage of the leprous or those hereditarily tainted by the disease. It seems to us then, in searching for the actual cause of leprosy, most important to determine in the first instance, in regard of any given place, whether the disease is only propagated or produced, and if partly propagated and partly produced, to what extent relatively.

A.—*Propagation of Leprosy.*

Now, the causes of propagation are mainly three :—

1. Intermarriage of the leprous or with the leprous.
2. Hereditary transmission.
3. Inoculation and cohabitation.
4. Vaccination ?

First. As to intermarriage little need be said. It sufficiently accounts for the occurrence of a large number of cases of leprosy in the offspring of lepers. We mention it specially here in order to impress upon observers the necessity of making due allowance for its influence; and this leads us to refer—

Secondly, to hereditary influence, which is most marked in children who are begotten by lepers far advanced in the disease. Of 623 cases to which reference is made in the Leprosy Report of the College of Physicians, 287 were known to be hereditary, and it is no doubt probable that this is not a correct proportion, since leprous taints in families are as much as possible concealed.

Thirdly. As to cohabitation and inoculation. Of course these are not such potent causes as intermarriage and hereditary tendency in spreading leprosy, but still it is probable that they account for a certain numer of cases. The Leprosy Report of the College of Physicians tells us that " the all but unanimous conviction of the " most experienced observers in different parts of the world is quite opposed to the " belief that leprosy is communicable by proximity or contact." In a general sense and under existing conditions the view here taken may be correct; but there is by no means a slight body of facts which seem to show that the inoculation with matter from a leprous sore, and this may occur in cohabitation and constant contact and in vaccination (?), may give rise to the disease. It is certain that at present there exist certain conventional impediments to the occurrence of contagion which, so to speak, has no fair chance of operation. We have no right to conclude that leprosy is not contagious because it does not show this quality under present circumstances. As we have elsewhere observed, in order that we may conclude with certainty that the disease is not contagious, it would be necessary to remove all the impediments which have been raised by tradition, popular prejudice, and legal enactments, and which have kept lepers practically in an isolated world of their own, and to secure the freest intermingling of lepers with the healthy of the community (which does not at present take place), and then to observe no increased spread of the disease, before we could fairly say that leprosy cannot spread by contact. As Mr. Macnamara very pointedly observes, " That leprosy does not spread by contagion among " the natives of India is in itself an hypothesis, but presuming it to be a fact it " may be explained; for although lepers move about among their countrymen, they " are to a great extent isolated from them. Who ever saw a healthy native touch, " much less eat, with one afflicted with leprosy? In many parts of India the fact " of admitting a leper to a general hospital is sufficient to drive away every other " person out of it. The wealthy leper may purchase immunity from some of the " social evils to which his poorer brethren are exposed. But even he is frequently " obliged to leave house and home and to wander as an outcast over the face of " the earth, visiting shrines and holy places in expiation for his sins, which he " believes has been punished by the infliction of leprosy. Rich and poor lepers, " however, though living and moving among their fellow-men, are as a general rule " as isolated from them as were those condemned to the lazar-houses in the middle "ages." But we may appeal to positive facts, showing that leprosy is apparently spread by the free contact of the healthy with the leprous in districts in which its appearance and spread can only be explained apparently in this way, and where in some cases the diet and *morale* of the people has marvellously improved and leprosy is not endemic in the district. Dr. Davidson, in speaking of leprosy in Madagascar, remarks, "It certainly deserves notice, that while the laws of Madagascar excluded "leprous persons from society, the disease was kept within bounds, but after that "this law was permitted to fall into disuse, it has spread to an almost incredible "degree. This is no doubt due in part to lepers being allowed to marry without "hindrance; but the natives are also strongly impressed with the conviction that "the disease is inoculable" (Lep. Rep. p. 221). It may be said that this is the result of intermarriage. Be it so. Then we refer to another very remarkable series of facts, which are contained in the appendix to the excellent pamphlet of Mr. Macnamara on leprosy, and are contributed by Dr. Hillebrand, of Honolulu. The disease was thought to be unknown in the Sandwich Islands till 1859, and, on close scrutiny, cannot be traced further back than the year 1852, or at the earliest 1848. Dr. Hillebrand has been at Honolulu since 1851. A recent census numbers the lepers at 250, or nearly $3\frac{1}{2}$ per thousand of the natives, and he thinks this is below the average. The disease seems to have been brought by the Chinese in 1848. Here, then, the influence of hereditary transmission is out of the question. The disease arises in a clean nation; is unnoticed at first, and spreads slowly. And in no case can we better study the question of contagion. It so happens that the hygienic state of the natives and colony has improved, and not deteriorated. Animal food is within the reach of all. Labour is in great demand and well paid for. The natives are clad now like Europeans; formerly scantily, if at all. The climate is, perhaps, the finest in the world. Taxation is light. Yet, notwithstanding, leprosy spreads, and has spread from and around known lepers as from centres of contagion. Dr. Hillebrand saw the first leper in 1853, about twenty miles from Honolulu; in 1861 he had got very bad, and six other persons in his neighbourhood had become affected. The same thing was observed, in 1864, in another village, the tax-gatherer of which had been for years the only leper in the place. Dr. Hillebrand observes "that the natives are of a very social disposition; "much given to visiting each other; and that hospitality is considered as a sacred "duty by them. . . . About one-fourth avow contact with other lepers as a cause." Dr. Hillebrand gives the details of several very interesting cases. As candid and scientific inquirers, we cannot overlook the significance of such facts as these and the attacks of those who dress the sores of the leprous. Of course in such a case as that of Honolulu, where the disease is *propagated* apparently and not *produced*, it is no use looking for the *de novo cause* of leprosy.

It has been said that leprosy may be communicated by vaccination, but if so it must be infinitely rare and scarcely worthy of being taken into account. It appears, then, that in searching for the cause of leprosy we must make allowance for a large amount of *propagated* disease, through intermarriage, hereditary transmission, and contact with the affected; for, in fact, disease propagated from individual to individual. Having first, in regard to any particular district, determined its amount, we are then in a position to investigate the *production de novo* of the remaining mass of disease. Again we repeat it is of vital importance to make a clear distinction between the *propagation* and the *production* of leprosy, otherwise we shall be sure to miss or obscure the cause of leprosy, because we shall be trying to trace the operation of a like cause in the case of the two different classes of leprosy, and this will only make us miss the real cause of that produced *de novo*.

B.—*The Production of Leprosy.* (The cause.)

Now what may we conclude from a survey of the circumstances under which the cessation of leprosy in certain parts, as in England, took place? The Leprosy Committee of the College of Physicians in their report say: "This happy change "(the disappearance of leprosy) perhaps may have originated, and been continued, "from the much smaller quantity of salted meat and fish now eaten in these "kingdoms; from the use of linen next the skin; from the plenty of better bread; "and from the profusion of fruits, roots, legumes, and greens, so common in every "family. Three or four centuries ago, before there were any inclosures, sown "grasses, field turnips, field carrots, and hay, all the cattle that had grown fat in "summer, and were not killed for winter use, were turned out soon at Michaelmas

" to shift as they could through the dead months, so that no fresh meat could be " had in the winter or spring. Hence the marvellous account of the vast stores of " salted flesh found in the larder of the eldest Spencer in the days of Edward II., " even so late in the spring as May 3. In Lent, too, the poor used to consume " large quantities of fresh and salt fish, and the bread was made of barley and " beans ;" which means that the cause of leprosy was one of diet.

But we may reply, why was not leprosy *produced* by the bad conditions above described? The quotation assumes that the peculiarity of diet was the *cause* of leprosy in England in the middle ages; whereas the presence of the disease was clearly, in greatest part, if not entirely, to be accounted for by its introduction through the Crusaders from the East, and its propagation by inter-communication of the leprous with the healthy. The extinction of leprosy was effected, we believe, in all probability by the enforced segregation of lepers, so sedulously ensured by the Church and State. The same events repeated themselves on the Continent. It is unsafe to draw final conclusions from our knowledge of past occurrences, and we had better study those of to-day to ascertain the cause of leprosy. The influence of climate and diet are the two points to which attention is and should be perhaps particularly directed.

First as to climate. Dr. Hobson, speaking to this point in commenting on leprosy in China, says very pertinently that the disease "exists in Norway and " Hindoostan, in the Arctic Circle and China, Iceland and New Zealand, the Cape, " Morocco, Mexico, Sandwich Islands, Borneo, Batavia, throughout Asia Minor, " parts of Russia, and Carthagenia," therefore in all kinds of climates, at all elevations, both inland and on the sea-board; hence it can scarcely be that climate, *per se*, has much influence. Of course leprosy is propagated not produced in some of these places, ex., the Sandwich Islands, but making due allowance for this, it is clear that leprosy is seen in all kinds and varieties of climates. We must look well to concomitants to explain the genesis of leprosy. But still the influence of climate does sometimes appear to accelerate or favour the occurrence of, if not produce leprosy. It will be noticed that those who are affected with the disease have had frequent attacks of "fever," and their general health has been much impaired. But the evidence we at present possess does not warrant us in saying more than this, or in asserting positively that the disease is of malarial origin. The connexion between leprosy and malarial poisoning may however be of the closest kind. Attention needs to be specially given to this point.

Next as to diet. This is of prime moment. It has been the fashion to ascribe the origin of leprosy to the consumption of fish in abundance, and as the chief article of diet, and fish moreover which is stale or bad. Others again have looked upon the consumption of rancid oil, others that of bad cereals, as the cause of the disease. Now as regards the influence of a fish diet, leprosy is very abundant in certain sea-coast districts and amongst fish-eating people. There is no question of this. In Egypt the natives feed on a beastly compound of semi-putrid fish called "fasciah;" in Norway again the consumption of fish is large, as also at the Cape, and in parts of India, &c. But on the other hand there are many exceptions in places where leprosy is endemic, in disproof of the theory of the causation of leprosy by ichthophagic habits. It is very advisable that we should have more facts on this point and with reference to the influence of the large and constant consumption of oil of a rancid kind. Another peculiarity of diet which may have great influence on the genesis of leprosy, is the absence of such vegetables as contain a large amount of potash. Mere poverty of diet will not suffice, as the case of Ireland very clearly shows, to produce leprosy, for in this country the wretched state of the population has not produced leprosy, probably in great measure on account of the abundant consumption of the potato. It is a curious fact, worthy of mention in this place, that leprosy has much diminished in Iceland since the introduction of the potato into that country. This statement is made on the authority of Dr. Hjaltelin, the chief physician of Iceland.

The use of grain grown on uncultivated land is a matter that demands every consideration. In England it is usual to hear the people of that great tract of country, India, spoken of as of one race, but it would be perhaps more appropriate to speak of the various nationalities of Europe as one people, than to believe that the Bengalee near Calcutta, the Rajpoot of Oudh, and the Puthan of the Punjab were one people. As to climate and modes of living, these races are also very differently situated. We find the Bengalee living in a humid, steamy, and malarious atmosphere all the year round, and feeding almost exclusively on rice and fish.

The Rajpoot lives on a hot level plain, which is dry and comparatively non-malarious for nine months in the year, but for the other three flooded with heavy rains, and feverish. His food consists of wheat made into unleavened cakes, and dhal, a sort of pea. The Puthan again lives in a more northern and elevated country, the winter of which is colder and more prolonged, while the rains are later and more uncertain. He lives principally on wheat, but eats butcher meat whenever he can afford to have it. Now amongst these people there is one frequently successful means of improving all the symptoms for a time or permanently holding the disease in abeyance, and that is a liberal supply of nourishing food; we are therefore led to look to the character of the general food used. In relation to this matter Dr. Farquhar's observations made in the Punjab some years ago, and subsequently followed up in other parts of the Bengal Presidency are of interest.

A grain merchant who came to Dr. Farquhar's dispensary in the cantonment of Sealkote, suffering from leprosy, stated a fact in regard to his food of much significance. The village he lived in was surrounded by cultivated land, the wheat grain from which he was in the habit of receiving for sale. In the neighbourhood, however, there were vast tracts of uncultivated land, over which a nomadic race, living in tents, wandered with their flocks. When rain fell plentifully, in any particular spot, at a propitious season of the year, these people set about turning up the soil, to the depth of an inch or two, with primitive ploughs, consisting of stout sticks burnt at one end and tied on to bullocks by strings.

The wheat grain was then cast into the ground, covered over, and in due time yielded corn. The area thus sown was too great for the few people to reap the straw from, so only the ears of corn were plucked from the stalks and gathered into sacks. The grain seller added, that he bought this inferior-looking grain from these people, and because his customers, as a rule, disliked it, he lived upon it himself, and sold all his good grain. The idea struck Dr. Farquhar that this uncultivated and poor grain might have something to do with the leprosy, and following up the thought, he found in other parts of the country, what appeared abundant proof of leprosy being associated with the consumption by the population of inferior grain. He found the disease to be common in another district in the Punjab, where a large uncultivated plain was near to a long line of villages, near a cultivated district. This plain was sown only at intervals of a year or two, when the rain fell, and no manure or other care, beyond the ploughing and reaping, as above described, was bestowed on the soil.

Leprosy Dr. Farquhar noticed was comparatively absent in those districts of India, where there was long-established cultivation of a higher order, where the fields are properly cared for and manured, and where man lives industriously by "the sweat of his brow."

In the rice country of Bengal, where cultivation has been long established, there appeared to be an argument against the "uncultivated grain" theory of leprosy; on inquiry, it is found, however, that the Bengal ryot exhausts his soil, by drawing yearly, sometimes three crops from it, and that the grain (rice) produced at one season of the year is known among the people to be unwholesome. New rice is also known to be deleterious, and is eaten only by the poor ryots themselves, who live in extreme poverty, through the rack-renting practised by so many of the native landlords. The facts too, that diseases similar to those produced by ergot of rye, as by Kessaree dhal, &c., are common in India, suggests the advisability of our studying the character of disease in relation to different kinds of food. We see, for instance, in the Upper Provinces of India, where unleavened cakes of wheaten flour form the staple of the food of 60 or 80 millions of people, *calculus vesicæ* is a very common disease, while in the rice-feeding 30 millions of Bengal Proper, this affection is comparatively very rare.

The extraordinary statement also that in the "Patna" district of Bengal, leprosy exists in a large proportion of the population in a slight form, should be further and specially investigated and reported on.

It may turn out after all that the use of grain grown on uncultivated land is not of much moment in regard to the cause of leprosy; and that it is only coincident with residence in an undrained and marshy (malarious) locality, which also may have nothing to do with the genesis of leprosy. Some observers declare that the subsidence of leprosy and ague go on *pari passu* with the introduction and extension of drainage in localities in which leprosy has been endemic.

The late Dr. Kinlock Kirk supposed, as the result of his observation, that the use of the leguminous seeds, common in India under the name Dâl, is capable of giving rise to something like leprosy, and especially in the case of the dhal derived from the cytisus cajan, and called "urhur." This is consumed by the poor under the idea that it enables them to bear great labour; it gives rise as an occasional meal to general disturbance of health and rheumatic pains. Some eat it constantly, and the final results are urticaria, sense of heat in the stomach, redness of the mucous surface of the mouth, bronzing of the skin, sponginess of the gums, burning of the hands and feet, dryness, harshness and cracking of the same parts, rheumatic pains, white spots indicating a leprous taint about the body, and lastly confirmed leprosy. Another dâl, the lathyrus sativus, we know, induced paraplegia. How far the use of dâl may be the cause of leprosy requires to be determined. But it must be recollected after all that leprosy may result not from the operation of any positive poison in climate or in diet, but negatively from the absence in the diet of certain principles, such as nitrogen and potash, and that it is accelerated by bad residence, uncleanliness, poor diet of all kinds, fever, and the like.

These remarks it is to be hoped will suffice to indicate the direction in which we should attempt to make out the *causa vera* of leprosy.

The following particulars, embodied in questions, seem to require elucidation in regard to the presence and cause of leprosy in different districts and individuals:—

A.—LEPROSY IN DISTRICTS.

1. The name and situation of your district?
2. The nature of the district, inland or sea-coast?
3. Is the disease endemic?
4. Is it an importation and only sporadic? How many forms do the natives recognise?
5. What is the nature of the climate? Malarial or not?
6. Is the disease on the increase or decrease? Give statistics if possible.
7. In what races and castes does it exist? and by preference? Is it frequent in Europeans?
8. The general character of the diet of the population as regards fish-eating, dâl-eating especially?
9. What is the extent of the cultivation of the soil? Is the grain used obtained from the district, or imported? If imported, is it of bad character? How much of the grain used by those in leprous districts is grown on uncultivated land?
10. Give any facts showing a gradual and related decline of leprosy in districts which have gradually undergone cultivation or in localities or communities into which the use of fresh vegetables, ex., the potato, has been introduced?
11. Give any facts showing that leprosy and "ague" have decreased in amount *pari passu* with increased cultivation and drainage of districts?
12. What other forms of disease are considered as akin to leprosy?

B.—LEPROSY IN INDIVIDUALS.

1. What reason is there to believe that the disease in your district is propagated by intermarriage, cohabitation, and hereditary tendency, as distinguished from its being produced by some cause external to the individual, especially some peculiarity of diet or climate? What is the proportion of *propagated* to *produced* cases?
2. Will hereditary taint often account for the disease where it is supposed to be due to some dietetic mal-influence, or where this is not to be found as a probable cause?
3. In what proportion of cases has severe and perhaps repeated attacks of malarious fever occurred in the individual prior to the onset of leprosy?

LEUCODERMA, OR WHITE SKIN.

This affection, common in India, is simply a disorder of the pigmentation of the skin. It consists in the development of white patches, due to deficiency of pigment *without any textural alteration whatever*, no tubercles, no anæsthesia, being present. It has no relation to leprosy, nor to morphœa. It may be partial or general; when extensive it gives the individual a piebald appearance. The hairs of the affected part are often white. Several other diseases are confounded with leucoderma, because in them localised deficiency of pigment is observed, but they are associated with serious structural alteration. Such confusion should be avoided. The well-to-do natives of India suffer from leucoderma, and the question they put the doctor for solution is:—Is this leprosy? The hakeems are divided in opinion about it. Leucoderma, as before observed, has nothing to do with leprosy. It may be as well to add that the deficiency of the pigment in the white circular spots of leucoderma may be accompanied by an excessive accumulation in the part around, so that we have a white centre and very dark areola,—a very unequal distribution of pigment in fact, but still *no structural alteration*. The general features of the disease are well illustrated by Plate VII., for the use of which we thank Mr. Hutchinson.

Is the disease more common in your district among the higher classes or the fair-skinned than amongst the poorer or dark-skinned people?

[Dr. Farquhar's observations lead him to conclude that the fair-skinned individuals among the natives are most subject to this change of colour, and that leucoderma is very common about Peshawur, where the inhabitants have very fair skins, being for the most part immigrants or the children of immigrants from the fairer tracts of Central Asia.]

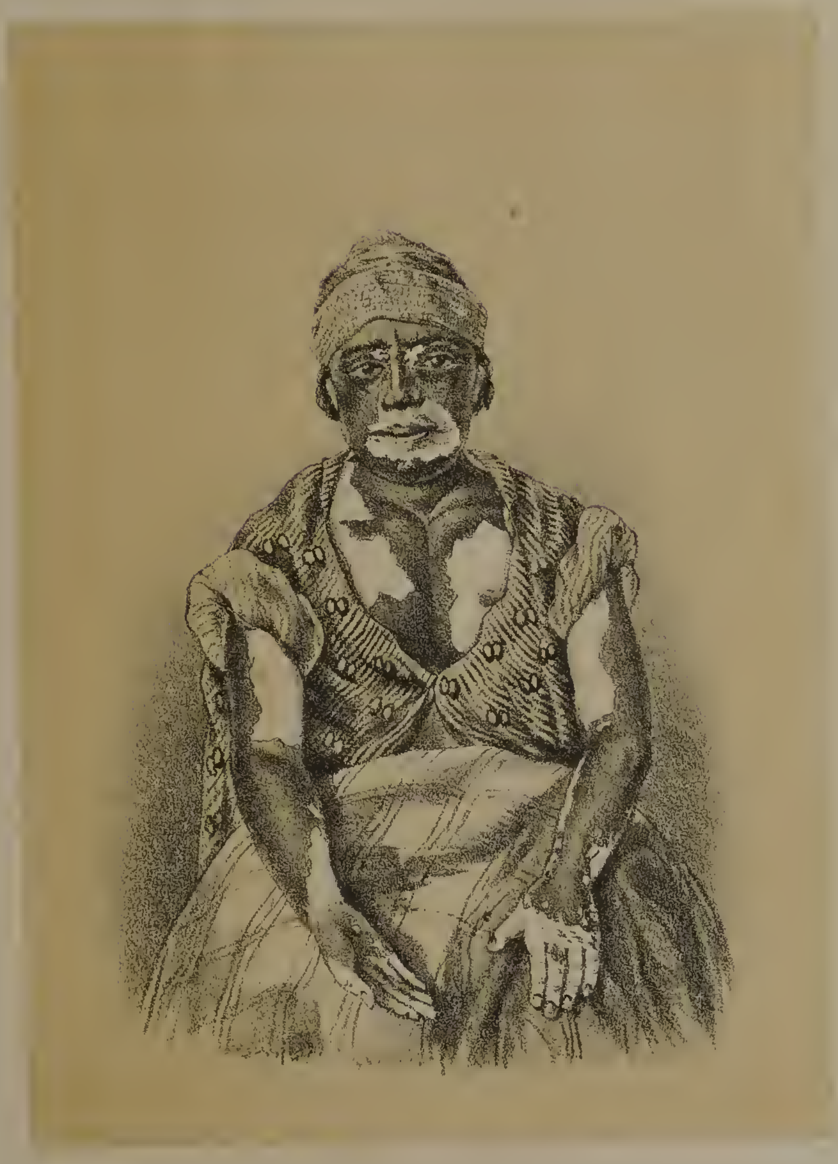
PITYRIASIS VERSICOLOR, OR TINEA VERSICOLOR (Chloasma).

We do not mean to say that this is an endemic skin disease of India, and do not notice it as such, but only because it would seem to offer certain peculiarities when it occurs in India, and chiefly in that it is much more severe and extensive, than in England. As seen in England and in whites, the disease is characterised as a fawn-coloured discolouration of the skin, in small or extensive patches, of an itchy nature, giving off branny scales when scratched. These scales are invaded by fungus elements, as seen under the microscope. The explanation of the disease being more extensive and severe in India, is probably to be found in the fact that conditions in that country, the heat and moisture which abound more or less, are particularly favourable to the luxuriant growth of parasitic fungi. If the fungus grows at the outset of the disease rapidly and freely, in this country we observe the disease to consist of bright red erythematous rings. The red ring extends as the mycelium sprouts, whilst the centre pales, becomes fawn-coloured and furfuraceous, and this fawn-coloured area increases whilst the circumferential redness declines. It will be interesting to know if this is often observed in India. Again, we have noticed that the disease, when it has originated in India, has been so severe and extensive as to have been mistaken for syphilis on several occasions, the patches being more generally scattered and raised than usual, and being accompanied by redness and a deeper tint in consequence of the greater amount of fungus and irritation present. It should be remembered that syphilis never gives rise to extensive discolouration as the only development of the disease. Lastly, in pityriasis versicolor of hot climates, there is sometimes a good deal of pigment deposited, and it would be an interesting question to know whether the so-called "pityriasis nigra" is not so produced. We have seen one such case. These remarks are only intended as suggestive.

BURMESE RINGWORM.

In various parts of the East many local designations are given to ringworm of the surface of the body (tinea circinata as we have called it, and as it has been called in the new nomenclature of the College of Physicians). Hence there would appear to exist in different places peculiar diseases apparently different, but in reality one and the same in nature. Chinese, Burmese, Tokelau ringworm and Malabar itch are examples in question. It is highly probable that these affections are nothing more or less than ordinary ringworm of the body, such as we have in Europe, determined in their occurrence to certain parts of the body by peculiar circumstances, and assuming characters somewhat different from those observed in the disease as it exists in colder climates, in consequence of the greater luxuriance of the parasite, consequent upon the presence in the one case of a greater amount of heat and moisture, which are favourable to the development and speed the growth, of fungi.

Burmese ringworm, as far as we have observed, and we have had many cases under our care, is in reality the "erythema marginatum" of the Germans, which has now been shown by abundant proof to be nothing more than a modification of tinea circinata (or the old-fashioned herpes circinatus of the surface). It occurs about the fork of the thigh chiefly, where heat and moisture are more influential than elsewhere. It is a vegetable parasitic disease. In England we see the disease, in those who have returned from India, in two chief forms, or rather in two different degrees of extensiveness. In the one the disease consists in red itchy rings affecting the pubic region, the fork of the thigh, extending over the buttocks, and more or less about the axillæ, the front part of the chest, and the parts covered by hair about the navel. The rings vary in size from that of a shilling to that of



LEUCODERMA IN A PORTUGUESE WOMAN

From the Catalogue of the New Sydenham Society's Atlas.

Vincent Brooks, Day & Son Lith

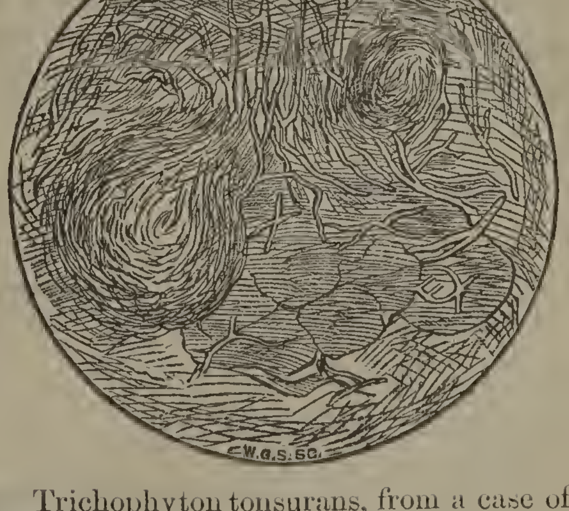
the palm of the hand nearly; the colour is bright, the rings are itchy, and their surface is to some extent raised, and they leave behind furfuraceous surfaces. The aspect may be altered by scratching, so that the integuments become excoriated and infiltrated. All this means that the fungus is made up of actively-growing mycelial threads that sprout freely and forcibly amid the epithelial layers. Sometimes the disease seems to disappear, and only slight scaly, itchy, scurfy patches remain behind. Again it lights up and reappears in all its intensity.

In the other form or degree, the disease is less erythematous, does not take on the ring form, and appears to be limited to the fork of the thigh and the parts about it. There is a red, scaly, itchy surface which festoons a greater or less distance down over the thigh in front, and attacks the perinæum and the buttocks to some extent. The disease begins as a small itchy scurfy spot—that is to say, the fungus does not luxuriate so freely and so produce red rings—and as this spot spreads the centre pales or rather gets brownish; the red edge extending. The edge is sometimes distinctly papular, and very well defined. The papules are mostly abortive vesicles, but even vesicles may be visible. If we pass the hand over the patches they feel thickened, dry, and harsh. If the disease is much scratched and irritated it may appear eczematous, or small boils may appear, or there may be a certain amount of lymph infiltration as the result of the irritation, and in such a form as to give the patch an uneven, somewhat knotty aspect and a very rough feel. The disease may after a while break up into islets—one part getting better, another becoming worse, or remaining *in statu quo*. The disease as a whole, often, if left undisturbed, gets "better and worse." It is always itchy, especially with the warmth of the bed, and the skin is, in chronic cases, much discoloured. The fact that the disease occurs where heat and moisture are present accounts for the amount of change induced, and also the variation from ordinary tinea circinata, from which it differs mainly in being accompanied by more infiltration.

Nature of the Disease.—Hebra now admits in "Eczema marginatum" the presence of a fungus, but thinks the disease is tinea engrafted upon an eczema. But it begins as tinea, and not eczema. Kobner, in 1864, described the fungus, and produced tinea circinata on his own arm by inoculation with it. Pick holds that the disease is an intertrigo and a tinea circinata, but as we affirm, it is a tinea circinata modified by the presence of ample heat and moisture, which causes the fungus to luxuriate, and consequently the tissue changes to be greater than in ordinary ringworm of the surface.

Now it is easy to see that the occurrence of bright red rings is only a stage of the disease, occurring when and where the fungus happens to find itself in such a condition as to be able to sprout beneath the epithelial tissues far and wide, and that very rapidly. We sometimes see the same red rings in the onset of tinea vesicolor. But in most cases we have a more gradual growth of fungus, and the production of scurfy patches. We suspect that Burmese ringworm is common in India. When erythematous itchy rings occur about the hairy parts and gradually increase whilst their centres become pale and branny and brownish, or when red itchy patches appear with a well-defined papular edge, and presently become furfuraceous, the scales of such places should always be carefully examined for a vegetable parasite.

The fungus may be detected by scraping off some of the scales of a patch, placing a very thin layer under the microscope—after adding weak liquor potassæ and allowing it to soak for some time—and making careful examination. We must take very thin portions of scale. Sometimes very fine moniliform chains of spores are seen, at other times freely branching mycelial tubes of fungus (trichophyton). The following is a representation of the mycelial threads of the fungus as seen in the scrapings from a case recently under our treatment.



Trichophyton tonsurans, from a case of Burmese ringworm.
U. C. H. Skin Clinique, April 1869.

The disease under notice is very unhappily called "eczema marginatum." It is not an eczema at all. It is not a serous catarrh of the papillary layer, and is not characterised by sero-purulent discharge drying into thin yellow crusts and stiffening linen.

It is, however, satisfactory to be able to simplify matters by including Burmese ringworm under the term Tinea circinata.

It is only necessary to add that Indian medical officers will do great service if they will investigate the nature of Burmese and all other " ringworms " bearing " topographical " or " popular " names, with a view to discover if they be not one and all referrable to " tinea circinata," their peculiarities or rather minor differences being accounted for by the influence of climate and the like.

MALABAR ITCH.

We know nothing of this disease in England, but are informed that its characters are those of Burmese ringworm. Information touching Malabar itch would be very acceptable, interesting, and valuable.

N.B.—Microscopic observations, with sketches, of vegetable parasites found in " ringworms " are specially asked for, and preserved specimens mounted in glycerine or balsam, if possible.

LICHEN TROPICUS, OR PRICKLY HEAT.

The pathology of this disease is well worth the attention of Indian observers. The disease is regarded as a lichen, but every red pimple is called lichen. True lichen means a disease in which solid lymph papules are formed in the skin, and these undergo no further change when once produced, except absorption and resolution. True lichen is rare. In lichen tropicus, the skin is studded over with red papules, but these are vascular, and evidently formed at the sweat ducts. In some cases vesicles are interspersed with the red papules, showing that a certain amount of sweat has been produced and has collected in such a way as to uplift the cuticle and to give rise to sudamina. The cause of the disease, the heat, acts generally upon the surface, and the eruption is general. The itching is not primary, it is the consequence of the failure of the sweat function to relieve the skin, and of the retention of the sweat. The anatomical seat of lichen tropicus in our opinion is the sweat follicles. These are called upon to perform an excessive amount of work, congestion is the result, with failure of the sudoriferous function ; the surface is not properly cooled, the sweat products are retained, and morbidly stimulate the nerves of the skin, hence the pricking and burning, which is of course aggravated by everything that increases the cutaneous circulation, such as warm clothing and warm drinks. This matter is one worthy the attention of the Indian medical officer.

Note.—The influence of malarious poisoning has been alluded to in speaking of several of the diseases referred to in the foregoing pages. This influence may be on the one hand merely one which leads to prostration of the patient and disturbed nutrition of a general kind, so that the individual is more susceptible to the attack of disease in general ; or on the other hand the influence of malarial poisoning may be of a specific kind. The questions have been framed with a view to determine the exact influence of malaria (if any) in the production of the diseases under discussion.

Doubtless other skin diseases that are considered peculiar to India find no place in this document. It will be a matter of much satisfaction if the circulation of this paper should be the means of eliciting information relative to such diseases, to the benefit of medical science generally and dermatology in particular.

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LETTER

ADDRESSED BY

SIR WILLIAM PYM

TO

THE LORDS OF THE COUNCIL,

RELATIVE TO

A REPORT

ON

THE FEVER AT BOA VISTA,

BY

DR. Mc WILLIAM.

Presented to the House of Commons, in pursuance of their Address of May 14, 1847.

LONDON:
PRINTED BY T. R. HARRISON.

RETURN to an Address of The Honourable The House of Commons, dated May 14, 1847;—*for*

"A COPY of the Letter addressed by Sir William Pym to the Lords of the Council, dated April 23, 1847 (headed Eclair Fever), relative to a Report on the Fever at Boã Vista, one of the Cape Verd Islands, by Dr. McWilliam."

"ECLAIR" FEVER.

Sir, *April* 23, 1847.

AGREEABLY to the desire of the Lords of Her Majesty's Council that I should state my opinion upon the report submitted by Dr. McWilliam, Surgeon, R. N., to the Lords of the Admiralty, relative to the fever which prevailed at Boã Vista, one of the Cape de Verd Islands, in the years 1845 and 1846 (supposed to have been introduced to that island by communication with the crew of Her Majesty's ship "Eclair"), I have the honour to state for the information of their Lordships, that I consider Dr. Mc William's report to be a most valuable document, and that the variety of uncontrovertible evidence brought forward by him relative to the disease in question, has finally decided and set at rest a most important and long contested question relative to the nature and history of yellow fever, more particularly as to its infectious power.

Dr. Mc William had, from the peculiar circumstances attending the "Eclair" steamer, and the intermediate position of the small island, on which there was a military guard, with reference to the Island of Boã Vista itself, a most favourable opportunity of following up his investigation, which I cannot help saying he has done with great judgment, perseverance, and impartiality.

His object in carrying on his inquiry has evidently been with a view of bringing to light the truth by well-established facts, tracing the progress of the cases of fever, which occurred first among the persons employed in coaling and watering the "Eclair;" next amongst the guards stationed in the Fort; and last amongst the inhabitants of the towns and villages. He begins by stating that upon the arrival of the "Eclair" at the island, leave was given to the petty officers and a few of the sailors to land, and that the sailors resorted chiefly to the house of a person named Justinian da Silva Giorgio, who kept a spirit-store in the town of Porto Sal Rey; and states what is remarkable, viz., that this man was attacked with head-ache and general fever on the evening of the day on which he was visited by the people of the "Eclair." He was attended by Dr. Almeida, and during his illness, which lasted a fortnight, was visited by many of his friends, amongst others by two females, Anna Gaspar and Rosinha San Antao, both of whom had slight attacks of fever shortly afterwards; they soon recovered, and their illness attracted no notice whatever.

This was the first and a very early case of fever, although in a very slight form, originating from the "Eclair." The next, and a very strong case, is that of Luis Pathi, who had been employed in coaling and watering the "Eclair" after the crew had been landed. When the steamer took her departure from Boã Vista, this Luis Pathi returned to his home at the village of Rabil, and the day after went to Moradinha, a village not far off, to attend a festival, and on the 17th of September, four days after the "Eclair" sailed, while engaged in the dance, was attacked with illness and put to bed, where he remained for a week; when sufficiently recovered, he was carried back to his family in Rabil, where there was not a single case of disease of any kind amongst the inhabitants. In a short time, however, his whole household, consisting of his wife and three children, were attacked one after another by the fever, and all fell victims to it, with the distinguishing symptoms of black vomit, &c.

The two next remarkable cases of attack were Corporal Joaquim Agostinho and Private João Alexandre Roque, both belonging to the guard of the Fort in the small island. The corporal was taken ill on the

14th of September, the day after the "Eclair" sailed, and died with fever, delirium, and black vomit, on the third day. The private was attacked on the 15th September, and died on the fourth day, with the same symptoms. These two persons were attended during their illness by two privates, Miguel Barbosa and Pedro Manoel, both negroes. When relieved from the guard, they were, as a matter of precaution, not sent to the barracks, but to a house in the district of Pao de Varella. While there they were visited by different persons, but particularly by a European woman, Anna Gallinha, who cooked for them, and by Johanna Pereira, a native. The first was attacked with fever three or four days after the soldiers left the house, and died with high fever, delirium, and black vomit. The case of this woman, with this very suspicious symptom, was the first that created any alarm in the town of Porto Sal Rey, and occasioned many of the inhabitants, particularly the Europeans, to fly from the island. The disease from this time spread rapidly amongst the inhabitants of the neighbouring houses, and ultimately over the whole town.

The next case is that of Manoel Antonio Alves, the soldier who was ordered by the Commandant to bury the remains of the corporal and private who died in the Fort. He was taken ill on the second day after this painful duty, and relieved in consequence from his guard at the Fort, his comrades having hoisted a signal for a boat, which carried him to the barracks, where he continued very ill four or five days.

I have thought it necessary to give this short portion of the evidence which points out so decidedly the early attack of persons who had communicated with the "Eclair," more particularly as it has been asserted that no case of fever had appeared amongst the population until a month after the departure of the "Eclair" from the island.

The same kind of evidence is brought forward throughout the report, relative to the importation of the fever into the different villages; and in the words of Dr. Mc William, "in each town and village on the island, the disease first appeared in a single house, which became a focus for its dispersion in all quarters." And at page 117: "It is evident that the fever at Boã Vista possessed the properties usually attributed to a contagious disorder; and connecting this fact with the time and circumstances of the seizure of the soldiers at the Fort with fever, and of the appearance of the disease in the town of Porto Sal Rey, will, I think, leave no doubt of its introduction into the island by the 'Eclair,' and that the fever was propagated almost exclusively by direct intercourse with the sick."

The chief instruction given to Dr. Mc William was to inquire whether any disease of a similar nature to that which existed on board the "Eclair" prevailed in Boã Vista after the departure of that ship from the island, or, in other words, to ascertain "whether it could be fully and satisfactorily shown that any person who had visited the ship or tents where the sick were placed, contracted the fever in question and communicated it to others, and they to other persons in succession, who had not visited the ship or tents."* Those questions which have reference to the infectious or contagious power of the yellow fever, as I have before stated, Dr. Mc William has finally settled and brought to a complete test; and he deserves well of his country for the manner in which he has executed his mission.

Having said this much relative to Dr. Mc William's report, I am not inclined to notice the subjects he has entered upon after having so satisfactorily done his duty; in doing so he has gone beyond his province, and taken up questions quite unconnected with his instructions.

The subject, however, is one of such vital importance, and has been so long misunderstood, that I trust their Lordships will excuse me for entering at some length into an explanation of the nature and history of this disease, such an opportunity never having before presented itself for placing at rest a long-contested question relative to the infectious or non-infectious powers of the yellow fever.

For many years a controversy has been carried on by medical men relative to the infectious or non-infectious nature of the yellow fever; a controversy originating from an opinion that the marsh or remittent fever, and the disease known as yellow, Bulam, or black-vomit fever, are the same disease; this last, in the opinion of non-contagionists, becoming, from a variety of causes and circumstances, a concentrated remittent or malignant yellow fever. This controversy I trust is now finally settled by Dr. Mc William's report; and that the question ought not to have been upon the subject of contagion or non-contagion, but upon the existence or non-existence of two very different diseases. At page 75, Parliamentary Papers, I have stated that there are two distinct diseases prevalent on the coast of Africa: the one the remittent fever, from which our seamen suffer so severely in consequence of boat-service in the rivers. This is the same disease as the well-known Walcheren fever, the malaria of the Levant, and the jungle fever of India, and exists in all warm climates, in moist and uncultivated grounds. Any person who has had one attack of this fever is very liable to a second, and afterwards to attacks of ague. This fever is not infectious,

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* Page 74, "Correspondence respecting the 'Eclair,'" presented to Parliament, 1846.

The other disease is a very different one; it is in no way connected with malaria or unhealthy situations. It is unknown in the East Indies, in Egypt, or in Turkey, and is a native of and peculiar to the west coast of Africa, as the ***Pestis Bubonica*** is to Turkey and Egypt.

1st. It is a disease *sui generis* known by the name of African, yellow, or Bulam fever, and is the *Vomito Prieto* of the Spaniards, from its being attended with the peculiar and fatal symptoms of black vomit, a symptom which rarely if ever appears in the marsh or remittent fever.

2nd. It is highly infectious.

3rd. Its infectious powers are increased by heat, and destroyed by a certain degree of cold.

4th. It attacks natives of a warm climate in a comparatively mild form.

5th. It has also a singular and peculiar character; viz., that, like small-pox, it attacks the human frame but once.

This disease, from the west coast of Africa, has been at various times imported into different islands and countries; viz., to the different West India Islands, the Island of Ascension, and to different ports of Spain and North America, as in the year 1845 into the Island of Boã Vista.

It is now thirty-two years since I addressed the medical officers of the navy and army, calling upon them to take into serious consideration the peculiarities of this disease, with the view of preventing a recurrence of the mortality and miseries occasioned by it in different parts of the world, in consequence of the erroneous opinions existing relative to its nature and history.

No disease has produced so great a mortality in our colonies, or has been so little understood by medical men, as the one in question. Having had the advantage of seeing this disease, not only in the West Indies, but in Europe, and several times witnessed its dreadful ravages, I had the good fortune to ascertain the before-mentioned peculiarities belonging to it, and which up to the present time have not only been doubted, but denied, and asserted to be a gratuitous assumption on my part, and not founded on fact, more particularly that of its attacking the human frame but once—a peculiarity of the utmost importance to be generally known, as relating not only to the comfort of the sick, but as assisting most materially in the regulations necessary to be established with the view of checking the progress and cutting short the spread of this most fatal of all diseases.

It is however gratifying, and certainly most singular and remarkable, that the peculiar circumstances attending the "Eclair" steamer, during the year 1845, and the landing of her crew on the small island near Boã Vista, have tended in a great degree, if not altogether, to clear up, explain, and do away all doubts as to the nature of the disease in question; for it appears evident from the history of the "Eclair," that she had both diseases on board at different and distinct periods: viz., the marsh or river, during the months of April, May, and June, and the yellow or Bulam fever, with black vomit, from the 23rd of July to the time of her arrival in England.

The "Eclair" had been at anchor off the coast of Africa from January to June 1845. The crew had been a good deal employed in boats blockading the Sheabar River: and the first serious case which occurred on board from the time of her arrival from England was on the 3rd of April; from this date to the 8th of June ten seamen had died; and according to the report of Dr. Stewart, "the type of the fever was well marked remittent." From this time, the 8th of June, the crew of the "Eclair" continued healthy until the 23rd of July, the day of sailing from Sierra Leone (where the "Eclair" had been at anchor from the 5th of that month), as appears from Captain Estcourt's letter to Commodore Jones, in which he states: "We left Sierra Leone the 23rd of July with one case of fever, the remainder of the crew quite healthy to all appearance; but before reaching Bathurst, on the 10th of August, we had lost seven men from fever, besides a gentleman from Sierra Leone, Mr. Dawson, to whom I had given a passage." This man—the only case of fever on board—died on the fourth day after leaving Sierra Leone, with black vomit, the first case in which this symptom had appeared. From the time of his attack the disease spread rapidly, a passenger and thirteen seamen having died before arriving at Boã Vista, many of them with the same symptom, black vomit, and which appeared in most of the fatal cases afterwards until the "Eclair" arrived in England.

The "Eclair," after arriving on the 21st of August at Boã Vista, remained at anchor ten days before landing her crew on the small island; during which period five of the seamen died. This being considered a great mortality, the medical men unanimously recommended the landing of the crew, sick and well, on a small island half a mile distant from Boã Vista, with the view of checking the progress of the fever. This recommendation proved, however, an unfortunate and most melancholy mistake, and showed how little the medical men knew of the disease. They considering it the marsh fever, took no precautions—sick and well were allowed indiscriminate intercourse, and the deaths instead of diminishing, increased to a frightful degree, as appears from this extract from Captain Estcourt's letter of September 8, 1845*, "Following the unanimous advice of the medical men, and others resident here, I landed all the crew, placing those under the cover of tents who were well, and the sick in good airy rooms: a few soon recovered so as to walk about; but the fever spread rapidly among the crew, and between the 1st and 8th of this month we have lost three officers, six seamen, three stokers, four marines, and three boys, making the total number of deaths since leaving Sierra Leone, thirty-five."

By Captain Estcourt's letter, however, of the 11th September, three days later, it appears that forty men had died since leaving Sierra Leone.

How different would have been the result, if the steamer had kept at sea. Five men only having died on board in ten days, and twenty-eight during the same period when on shore.

This proves strongly what I have stated relative to the infectious power of this disease being increased by heat; the heat of course being much greater on this small fort, surrounded by a wall twelve feet high, than on board the steamer with the north-east trade-wind blowing fresh.

The following extract from the report of the medical men shows also the conviction of their melancholy mistake in landing the crew:—

"We are of opinion that the measures most conducive to put a stop to the progress of the disease, and promote the recovery of those at present ill, is for Her Majesty's steam-vessel 'Eclair' to be removed immediately to a much cooler climate. We are most decidedly of opinion that from the extremely malignant character of the fever, which has resisted the treatment usually found successful in the common endemic fever of the coast—its continuance since the removal of the 'Eclair' from the coast, under the present high temperature, as well as the extreme liability that all convalescents from severe coast fever have a return of the disease on again approaching the coast—the object desired will not be attained if the 'Eclair' continues within the tropics.

(Signed) W. F. CARTER,
Surgeon H. M's steam-vessel "Growler."
JOHN MACONCHY,
Surgeon H. M's steam-vessel "Eclair."
GAWIN M. M'CLURE, M.D.,
Additional Surgeon, "Eclair."

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* Page 45, "Correspondence respecting the 'Eclair,'" presented to Parliament, 1846.

This report, although it shows the conviction on the part of the medical men of their mistake, as to the landing of the crew, it shows also their non-acquaintance with the nature of the disease;—it shows that they were not aware either of its being the yellow fever, or of its being infectious; and it proves the melancholy consequences which may and do take place from medical men not being aware of the two distinct diseases.

This report, however, of Dr. Mc William has proved most clearly that the disease may be imported to an island; and if so, there can be no doubt of its being imported into a ship; and of this we have too often seen the melancholy results, not on the African coast only, but in the West Indies and in the Mediterranean.

In the year 1794, in the West Indies, after Sir Charles Grey's expedition, every man-of-war and transport on the station suffered severely from it, and without any suspicion of marsh miasmata; and the army was said to have lost 6000 men.

In the year 1795-96, the Army of St. Domingo lost above 10,000 men. The disease appeared at Gibraltar on the 29th of August, 1804, in the person of an individual who had arrived from Cadiz the day before, having resided in a house in which several individuals had died from yellow fever, then prevailing at Cadiz: no precautions were taken for a long period against the spreading of the disease; and it carried off, in consequence, in less than four months—

Officers.	Soldiers.	Soldiers' Wives and Children.	Civilians.	Total.
54	864	164	4,864	5,946

The garrison had been in possession of the British for 100 years, and this was the first time this disease had appeared within it walls.

The "Eclair" steamer was reckoned a most unfortunate ship from her having been the first vessel which had brought the fever to this country; but if we look to the cruizers on the African coast, as well as in the West Indies, it will be found that the loss of half the crew by this disease is not uncommon. In a newspaper we find the following list of ships on the African coast, with their mortality during a period of eight months, in the year 1837-38.

VESSELS.	DEATHS.			Original Crew.
	Officers.	Men.	Total.	
Raven	4	21	25	42
Bonetta	5	28	33	52
Buzzard	4	24	28	52
Forester	3	27	30	52
Dolphin	6	18	24	52
Fair Rosamond ..	1	18	24	52
Viper	5	8	13	52
Scout	5	43	48	120
Waterwitch	2	25	27	52
Brisk	4	15	19	52
Curlew	7	30	37	72
			308	650

What I have stated relative to the infectious nature of this fever, and the possibility of its being conveyed from the crew of an infected ship to that of a healthy one, will, I trust, be sufficient to induce the Lords of the Admiralty to give such instructions to officers commanding men-of-war in the West Indies and on the coast of Africa, as may prevent the introduction of this disease into their ships; they are ready enough to take precautions against the Oriental plague: but I can assure them that this is a much more formidable and fatal disease on board of ship.

I may here state, that in the year 1817 I addressed the Lords of the Admiralty upon this subject, at a time when the fever was committing sad ravages in the West Indies, not only on board ship, but on shore, in the hope that they would be induced to give instructions to officers commanding men-of-war to establish some system of precautionary arrangements, with the view of preventing the spreading of contagion from one ship to another, whereby a great loss of human life would be prevented. From the mistaken opinions of the members of the then Sick and Hurt Board, to whom my letter had been referred, I received a reply from Mr. Barrow, the secretary, the following of which is an extract:—

"Their Lordships are of opinion that the regulations which you suggest in the nature of Quarantine restrictions, would not be attended with beneficial effects, or are necessary, provided the usual precautions on board Her Majesty's ships in the West Indies and in other hot climates, are attended to."

A very great proportion of this mortality, I assert, is owing to the mistake (this is the mildest expression I can make use of) on the part of medical men with respect to the nature of this disease. Look to the fatal results as to the crew of the "Eclair" by being removed from a comparatively cold atmosphere on board of ship to a species of oven on shore where they were mixed up together, without any precaution or restriction as to intercourse. Look to the sufferings and mortality of the population of the Island of Boã Vista, in consequence of their communication with the crew of this ship. It has been said that the Governor of Boã Vista humanely offered the use of the island to the Captain of the "Eclair" for the convalescence of the crew. It has also been stated that this act of humanity was offered by the officers of Haslar Hospital, when the "Eclair" arrived at the Motherbank, but refused. Looking to the result of the hospitality at Boã Vista, was it not properly refused in England, several deaths having taken place on board of her or the hospital ship, even after her arrival at Standgate Creek, when the thermometer was at a much lower temperature than that which is supposed to put a stop to the disease. If the medical men had known the nature of the disease they had a very good opportunity of putting an end to it by carrying into effect something like the regulations which Dr. Mc William had recourse to at the village of Moradinha; and in such a case the employing of persons who have already passed the disease is of the utmost importance.

The various peculiarities attending this disease have been confirmed by the winding up of Dr. Mc William's report.

First. The infectious nature of the disease has been proved by its importation into the Island of Boã Vista and its general spread afterwards among the population, as well as by the attack of Mr. Barnard, who embarked at Madeira; the pilot, who embarked at the Motherbank; and the two medical men at Standgate Creek.

Secondly. Its attacking the natives of warm climates in a comparatively mild form. This has been proved most strongly in the case of the soldiers, there being only forty-one on the island, thirty-two of them natives and nine Europeans; of the thirty-two natives only three died, and of the nine Europeans eight died. The same was the case with the English residents; eight were attacked, of which number seven died.

Thirdly. Its infectious power being increased by heat is proved by the great increase of mortality when the crew were landed in the warm and badly ventilated fort, surrounded by a wall twelve feet high. Thirty-nine deaths having occurred in this situation in the course of fourteen days; five seamen only having died within nearly the same period when the crew were on board with a fresh north-east wind blowing.

As to its being a native of and peculiar to the west coast of Africa, it is difficult to bring forward positive proof of the existence of the disease on the African coast amongst the natives; because when they are attacked by it, it is in so mild a form that it rarely, if ever, proves fatal to them, and it is only in the persons of natives of a cold climate that the peculiar symptom of black vomit shows itself. From the importation of it, however, from that coast to the West Indies—and from its non-existence in any other warm climate, there can, I think, be little doubt of its origin. On board the "Eclair" steamer there were forty Kroomen natives of this coast, and it was reckoned singular that not one of them had been attacked by it. And from this circumstance, and from similar cases having occurred before, it was thought that the African negroes were never attacked by it; but supposing the disease to have been small-pox, the non-liability would have been reversed. The negroes would have all been attacked and European sailors would have escaped. Is it not, therefore, reasonable to assert that the Kroomen had had this native fever in their own country at some former period; and this is the more likely as it was found in Boã Vista during the prevalence of the fever, that negroes enjoyed no immunity, but were attacked indiscriminately with the other portion of the population by the disease, though generally in a considerably milder form. The "Bann," I believe, is one very well authenticated case of the importation of the disease from the coast into the Island of Ascension; but the importation of the yellow fever into the Island of Grenada, in the year 1793, is the most decided. It happened at a most unfortunate period, immediately before the arrival of the army of Sir Charles Grey into the islands, and in a very short time spread devastation every where; it was carried to Jamaica and St. Domingo, and even to New York and Philadelphia; and in consequence of the regular arrival of fresh troops, which added fuel to the fire, it became a resident in that part of the world during the whole of the war, and ceased with the non-arrival of fresh troops.

The following copy of a letter from Sir Joseph Gilpin is a strong proof of its importation into Grenada, and of its being a new disease; that no such disease existed in the islands for a considerable number of years before the arrival of the ship "Hankey," at Grenada, from Bulama, on the African coast; and it is a remarkable fact that it has been comparatively a rare disease in the West Indies since the cessation of slavery.

Extract of a letter from Joseph D. A. Gilpin, M.D., Inspector of Military Hospitals (now Sir Joseph Gilpin), to Colin Chisholm, M.D., dated Gibraltar, August 12, 1813.

"Of the infected state of the 'Hankey,' I never did nor ever shall entertain the least doubt, nor do I recollect that any medical man in Grenada held an opposite opinion. During a residence of eighteen years in that island, I had frequent opportunities of seeing the yellow remitting fever, but I have not the least remembrance that at any period previous to the arrival of the ship in question (the 'Hankey'), a suspicion even being entertained that it was contagious.

"During a lapse, too, of so many years, the state of the atmosphere and the prevalence of marsh miasmata must frequently have been as they were in 1793, and should consequently (the causes being the same) have produced similar effects.

"That those who visited the 'Hankey' brought the contagion into the town of St. George, and that it spread from thence into the country, I have as little doubt as I have of my present existence; and I really believe that had the most determined anti-contagionist been present during that awful period, he would have become a proselyte to the general opinion.

"(Signed) JOS. D. A. GILPIN."

As to the fourth and most important peculiarity, viz., that of attacking the human frame but once. As this fever had never appeared in the

Island of Boã Vista before, it could not be expected that much proof could be procured there. Dr. Mc William met with only three individuals who had passed the fever before at St. Domingo or Cuba, who were all most assiduous in their attentions to the sick; all three escaped an attack, and they attributed their immunity to that circumstance.

This peculiarity, however, I consider of such vast importance, I think it my duty to do all in my power at the present moment, while the question is pending, by bringing forward such proof as must finally set it at rest.

At Gibraltar, during the prevalence of the fever in the year 1804, there were fortunately several regiments in garrison, which at some former period had been quartered in the West Indies, while the fever was very general throughout the different islands. The following nominal list of officers who had and had not passed the fever at Gibraltar, is a document which ought to set at rest the question of liability or non-liability to a second attack of this very frightful disease.

In the corps of Royal Artillery there were only two officers who escaped an attack, viz., Brigadier-General Smith and Captain Campbell, and they had been in the West Indies.

In the Royal Engineers there was only one officer who had had it in the West Indies, and he was the only one who escaped an attack excepting Colonel Fyers, who had placed himself in quarantine.

In the Second, or Queen's Royals, there were five officers who had passed the disease in the West Indies, viz., Colonel Jones, Major Kingsbury, Captain Walsh, Paymaster Wainwright, and Surgeon Borlase, and all escaped, when every other officer in the regiment was attacked by it.

In the 10th Regiment, every officer was attacked excepting Captain Carpenter, who had had it in the West Indies.

In the 13th Regiment, there were eight officers who had had it in the West Indies, viz., Lieutenant-Colonel the Honourable Charles Colville, Lieutenant-Colonels Jones and Scott, Major Belford, Captain Wilkinson, Mr. Murray, Quarter Master, and the Adjutant, and all escaped it, although every other officer in the corps was attacked by it. This same regiment, with five of the above-named officers and ten of those who had passed it at Gibraltar, embarked for the West Indies in 1809, where they all escaped an attack of it, although eight of the newly-appointed officers fell victims to it.

In the 54th Regiment, every officer was attacked by it excepting Colonel Darby, Captain Louis, and Surgeon O'Dwyer, who had had it in the West Indies. This regiment returned to the West Indies filled up with new officers and men, and after being eighteen months in Jamaica, was attacked by and suffered severely from this disease, when all the officers and men who had had it in Gibraltar escaped.

In the Regiment De Rolle, every officer was attacked by it excepting Lieutenant Muller, and he had had it in the West Indies.

In the corps of Royal Barrack Artificers, every individual in the corps was attacked by it excepting Serjeant Jones, who had had it in the West Indies. Two more proofs of the Bulam fever not attacking a second time, were in the 55th and 70th Regiments; this last suffered severely from the disease in the Island of Martinique in the year 1794, and returned to the West Indies in 1800, filled up with new officers, with the exception of Colonel Dunbar, Major Elliot, Captains Johnstone, Lawrence, Hutchinson, and Boat, who had all the fever before, and now escaped an attack, although ten of the newly-appointed officers were carried off by it in a very short period.

The 55th was stationed in the Island of St. Lucia in 1796, where it was nearly annihilated by this fever, after which the skeleton of the regiment returned to England, was filled up with officers and men, and after being six years in Europe, embarked for Jamaica, where it arrived in 1802. In this island it again suffered severely, a great proportion of the men and twenty-one of the newly-appointed officers having fallen victims to it. Mr. Mc Millan, formerly surgeon to the regiment, says it is worthy of remark, that every individual in the corps was attacked by this fever excepting Colonel Hogg, Captains Brown, Muttlebury, Lee, Dickson, Jones, Crichton, Humphries, Carpenter, and Wilkinson, who had had it at St. Lucia. Upon a moderate computation, there were 150 officers (civil and military) at Gibraltar, in 1804, who had not had the disease before, and twenty-five who had passed it in the West Indies; and making an allowance for one or two doubtful cases where the disease was so mild as not to confine the patient to bed, 145 at least out of the 150 were attacked by it, while every individual who had had it before escaped an attack of it.

The occurrences at Gibraltar are sufficient proof that persons who have had the disease in the West Indies are not liable to a second attack in Europe; the 13th and 54th Regiments are proofs that persons who had it in Gibraltar are not liable to a second attack in the West Indies; and the 13th, 55th, and 70th Regiments, are proofs that persons who have had it in the West Indies are not liable to a second attack upon their return to that station after having been several years in Europe. This evidence, so decisive, not only as to its infectious powers, but as to its attacking the human frame but once, I trust will induce all medical and other authorities to give instructions for the same precautions being used against this as they would against any other highly-infectious disease.

As, however, some individuals may not be satisfied with the authority of this statement, I have been urged to bring forward the following most important document, which appeared in the "Gibraltar Chronicle" of the 24th January, 1829:—

"*Notice.*

"The Lords of His Majesty's Most Honourable Privy Council having, so long ago as the year 1815, taken into consideration a singular peculiarity asserted by Dr. Pym, in a published work, to belong to the *Bulam Fever* (the name adopted by him for the disease which has so lately prevailed in this garrison), viz., 'the non-liability of persons to a second attack;' and the Lords of the Council having referred the question to the Royal College of Physicians in London for their opinion, the College, in two successive reports, replied in substance as follows:—

"'That from the evidence before them there seemed strong reason to believe that persons are not liable to a second attack of that disease; but, in giving this opinion, they could not avoid bearing in mind the fallibility of all medical observations, and the extraordinary nature of the fact, which bears no analogy to the circumstance of those fevers which the *Bulam* most resembles; and they therefore feel that it will be impossible for them to give a positive assent to the assertion of the non-liability of the human frame to a second attack of the fever in question, until they shall be able to avail themselves of a more enlarged experience, and the concurring testimony and observation of a greater number of medical practitioners.'

"His Excellency the Lieutenant-Governor is of opinion that this most important question should, if possible, be definitively settled; and conceives that the present is the best time, and this place the fittest spot on the face of the globe, on which to accomplish this most desirable object.

"1st. Because there are now here a considerable number of medical men of different nations, almost all of whom have had the most ample opportunities of witnessing the progress of this disease during the recent epidemic, and some who have observed it in former years both here and elsewhere.

"2ndly. Because there are now said to be within the garrison 6000 persons who have had this disease, during its prevalence in the years 1804—13 and 14, without affording a single instance of a second attack.

"3rdly. Because the place itself is so perfectly insulated, and so limited in its extent.

"His Excellency, therefore, has directed Dr. Pym, principal medical officer, to propose four medical officers, selected from the staff of the garrison, to constitute a Board; to request the assistance of Drs. Chervin, Louis, and Trousseau, the three physicians deputed by the French

Government to investigate the nature of the late epidemic; and also to add to this Board such Spanish and British practitioners as he may think fit.

"As it is of the utmost importance to all nations, to humanity generally, as well as to science, that no doubt should any longer exist as to the question of liability or non-liability to a second attack; and as it is highly desirable that the present favourable opportunity for obtaining this result should not be neglected; his Excellency directs that the Board, constituted as above, shall assemble on Tuesday the 27th instant, and Friday the 30th (and such other Tuesdays and Fridays as they may think proper to appoint), at the Court-house, at 12 o'clock, to take into consideration the testimony of the different medical men, military as well as civil, in the garrison, upon all matters connected with this question; and the Lieutenant-Governor invites these gentlemen to afford every information in their power, as well by their personal attendance as by written documents, if required.

"By Command, S. R. CHAPMAN,
Civil Secretary."

"*Head-Quarters, Gibraltar, January* 23, 1829."

"*To his Excellency Sir George Don, &c. &c.*

"Sir, *Gibraltar, March* 31, 1829.

"The Board of Physicians convened agreeably to the notice published by order of your Excellency in the 'Gibraltar Chronicle' of Saturday, the 24th of January last, for the purpose of investigating the question of liability or non-liability to a second attack of the disease which has at different times prevailed in an epidemic form in the south of Spain, but more particularly last autumn in this garrison,—having now completed their inquiries on this interesting subject, have the honour to lay before your Excellency the following report of their proceedings.

"The Board consisted of the following physicians and surgeons, viz.:—

Dr. Louis,	The three physicians deputed by the French Government to investigate the nature of the late epidemic in this garrison.
Dr. Chervin,	
Dr. Trousseau,	
Dr. Broadfoot,	Deputy Inspector of Hospitals.
Mr. Dow . .	Acting ditto ditto.
Dr. Barry . .	Acting Physician to the Forces.
Mr. Dix . .	Staff Surgeon.
Mr. Frazer .	Surgeon Civil Hospital.
Dr. Ardebol,	Chosen by ballot from all the civil practitioners resident within the garrison.
Dr. Bobadilla,	
Dr. Mathews,	
Mr. Rouvier,	
Mr. Thurston,	

"These members having assembled on Tuesday the 27th of January, 1829, elected for their President, Dr. Louis, of the Royal Academy of Medicine of Paris; for their Vice-President, Dr. Barry, of the Royal College of Physicians of London, and Doctor of the Faculty of Medicine of Paris; and Dr. Trousseau, Supplementary Professor of the Faculty of Medicine of Paris, for their Secretary.

"The Board having unanimously, and upon the fullest conviction, admitted the perfect identity of the late and all the former epidemic fevers of this garrison and of the southern parts of Spain, since the year 1800, with the disease known by the name of *Vomito Prieto*, and yellow fever in America, the West Indies, and Spain, and so ably treated of by Dr. Pym, under the name of Bulam fever,—Resolved, that the general question as to the liability or non-liability to a second attack of this fever, should be divided into two questions, viz.;

"1. Whether an individual who had suffered one attack of this fever in Europe, is liable to a second attack of the same disease in Europe.

"2. Whether a person who had suffered an attack of this fever in Europe, is liable to be again attacked by it in America, the West Indies, or elsewhere, and *vice versâ.*

"This division was thought necessary, because an opinion has been expressed by some physicians as to the possibility of the constitution being deprived, by a residence of a certain number of years in a cold climate, of that immunity from a second attack of this disease, which they acknowledged is retained so long as the person remains in a warm or even in a southern climate.

"When the question of non-liability to a second attack of the Bulam fever was submitted to the decision of the College of Physicians of London in 1815, by the British Government, that learned body observed in their reply, 'that though, from the evidence before them, there seemed strong reason to believe that persons are not liable to a second attack of that disease, yet that a more enlarged experience, and the concurring testimony and observation of a greater number of medical practitioners, would be necessary to enable them to give a positive opinion.'

"The Board, convinced of the prudence of this observation, determined to avail themselves of the talents and experience of as many physicians as possible, and therefore resolved that all the medical men then resident in Gibraltar, civil as well as military, should be requested to attend the Board, and to communicate the result of their observation as to the subject in question.

"Various circumstances had collected a considerable number of experienced physicians of different nations in this garrison, during the late epidemic. Some of these physicians had witnessed several epidemics in the same town, particularly in Gibraltar; and though their evidence was the most valuable, it could not be exclusively admitted. The Board therefore determined to avail themselves of the testimony of those also who had not practised long enough in one town to have seen two epidemics, and, consequently, could not have personally observed many individuals exposed to the danger of contracting the Bulam fever more than once.

"As the Board could not ground their conclusions on bare assertion, it became necessary that the physicians interrogated by them should be requested, 1st. To state the symptoms of the presumed first and second attacks, which they might bring forward. 2nd. Whether they had ascertained the symptoms of the first attack from the patients, or whether not having witnessed either of the two presumed attacks themselves, they had positively and from a respectable source, ascertained the symptoms of both.

"In order to be able to form a just estimate of the number and the proportion of second attacks, it became necessary to know the number of patients that each medical man had attended in the course of his practice, and also to learn whether he knew, from his own personal observation, of any remarkable instances of immunity from a second attack of the Bulam fever in persons fully exposed to all the causes allowed, whether by contagionists, or non-contagionists, as most capable of producing a first attack. The following questions, therefore, were first sent round to the twelve senior medical men, in a circular letter from the President, and afterwards put by him *viva voce*, to all the medical men of Gibraltar, and to the members of the Board themselves, individually and personally, in their own respective languages, at a full meeting of the Board; viz.—

"'1st. State the number of cases that you may have seen in the late or any former epidemic?

"'2nd. The number of those whom you may have seen attacked in two different epidemic years, or of whose double attack, you may have obtained a positive and precise knowledge?

"'3rd. State some of the more remarkable instances that may have come to your knowledge, in which persons who had suffered the disease at a former period, resisted its influence in one or more succeeding epidemics, though fully exposed to all their dangers?'

"Thirty-three medical men were thus interrogated. The greater number of them had witnessed the fever in Spain only. The others had witnessed epidemics both in Europe and America, or the West Indies. The number of sick that they had all, collectively, seen or treated, amounted to nearly 27,000.

"One only of these medical men, Mr. Amiel, Surgeon, 12th Foot, who had witnessed four epidemics in this garrison, viz., those 1810, 1813, 1814, and 1828, had attended two persons in what he considered to have been second attacks of the Bulam or yellow fever.

"Mr. Wilson, of the Civil Hospital, stated that he had attended two persons last year, who told him that they had had the yellow fever in 1812.

"Mr. Amiel stated to the Board the symptoms observed by him in his two patients, in the years 1813 and 1814. Mr. Wilson stated those observed by him in his patients in 1828, and reported the evidence of the patients themselves, relative to the symptoms they had experienced in 1813.

"The Anglo-French Medical Commission, in the course of their inquiries, had met with nine persons who said that they had been ill in two different epidemics, at intervals of ten, fifteen, and even twenty-four years.

"The symptoms of each attack were collected from the persons themselves, who said that they had felt them, and were afterwards submitted to the examination of the Board.

"Four physicians had attended, in 1828, some patients, who said that they had had the yellow fever in one or other of the former epidemics, but as the symptoms of the first attack could not be stated, the Board could not take these cases into consideration.

"One military surgeon mentioned a fact relative to a soldier who, as he said, presented a sporadic case of the Bulam fever in 1826, and who was attacked by the disease during the epidemic of 1828. The Board, however, being limited to the consideration of cases of double attacks, in two different epidemics, and reflecting besides, that the existence of the Bulam or yellow fever, as a sporadic disease, is disputed in Europe, declined to enter on this question, as being foreign to their purpose.

"From what has been said, your Excellency will perceive that the Board had to deliberate on the validity of thirteen cases only, of presumed second attack. The votes, of the Members of the Board, were taken upon each attack of each case separately, without discussing the symptoms stated by the physician who brought forward the case; and for obvious reasons—these votes were given by ballot. Each member wrote on a slip of paper, which was folded up and handed to the President, one of the following words—Evident, Probable, Doubtful, or Inadmissible.

"One case of double attack was, upon the scrutiny being made, declared evident by the majority of the Board. This case was brought forward by Mr. Amiel, Surgeon of the 12th Foot, who had attended the subject of it in both attacks.

"Three cases of second attack were declared probable.

"One case had an equal number of votes for its being probable and for its being doubtful.

"All the others were declared inadmissible.

"Several very remarkable instances of immunity from a second attack were brought before the Board.

"Mr. Amiel had attended in Gibraltar, in 1810, two young men, brothers, of the name of Ray, labouring under the epidemic fever. In the year 1821 these young men happened to be on board a vessel at Barcelona during the prevalence of the fever in that town. Several persons on board having been attacked by the disease, the vessel was ordered to the lazaretto at Minorca, when the whole of the crew, nineteen in number, fell victims to it. The two brothers alone survived, and without having been attacked by the disease.

"Dr. Ardebol knew a considerable number of Spaniards in Havana, who, having had the Bulam fever in Europe, were not attacked by it in the West Indies; and he also saw many persons in Spain, who, during the last epidemic in Barcelona, were not attacked by the fever, which they had already gone through in America.

"Drs. Merry and Dias state amongst other remarkable facts of the same kind, that thirteen military physicians and surgeons, whose names they give, went to the Havana or Vera Cruz, after having had the epidemic fever in Spain, and were not attacked by the yellow fever of those countries, though daily in the midst of their soldiers, who were labouring under it at the time.

"Mr. Cortes, who has practised medicine in this garrison for the last thirty-six years, states that twenty-six persons of the same family left Gibraltar for the Island of Cuba; twenty-four of these persons had had the yellow fever here; the remaining two, who had not had the epidemic here, were alone attacked in Cuba.

"A still more striking and a more recent fact was brought before the Board by Dr. Broadfoot, relative to the orderly men and other attendants, who during the late epidemic were incessantly employed in the midst of the sick in the military hospitals. Of these persons thus employed, 164 were soldiers, who had never had the Bulam fever, and 61 were natives, Spaniards, or Portuguese, who all, except two, had already passed through the disease in some former epidemic.

"Of the 164 soldiers, 141 were attacked at various periods of their attendance upon the sick, whilst of the 61 civilians employed in the same service, the two only who had not had the fever before caught the disease.

"The very curious and valuable documents on which this fact is founded, are the official returns made out and signed by the surgeons of the different regiments, and extracted from the registers of their respective hospitals.

"From these facts then it is evident that one attack of the Bulam or yellow fever preserves the individual from a second; invariably, the Board would have added, did not even the very small number of cases of second attack brought before them seem to show that there may be some rare exceptions to this rule in this disease, as there certainly are with regard to the small-pox itself.

"Thus the opinion so universally and so deeply rooted at present in the minds of the whole population of the southern parts of Spain is confirmed. Thus the well-founded security from a second attack of this dreadful malady, now ensures to the sick those attentions which the terror inspired by their disease had, in spite of every tie, so often deprived them of, before this belief was established by facts. Thus the bold but provident parent now feels himself justified in exposing, and frequently does expose, his infant offspring during an epidemy to the influence of the disease, knowing that it is less fatal at this early age, and that once passed it is no longer to be dreaded.

"After what has been said in this report and in the notice issued by your Excellency's order, already alluded to, it is unnecessary to point out the immense importance attached to the solution of the single sanitary question which, through the wisdom of your Excellency, has been submitted to the deliberation of the Board. The numberless lives that the knowledge of the fact it involves, may hereafter be the means of saving; the many valuable lives that it has already saved in the late and other epidemics, both here and elsewhere; the additional facility, steadiness, and security, which this knowledge will give to all precautionary measures in times of epidemic infliction; the security that it will afford to the attendants on the sick, when properly selected; the important sanitary arrangements which may be founded on it, in reference to British troops destined to serve in the West Indies.

"The Board cannot close their report on this most interesting subject, without acknowledging the large debt of gratitude which science, commerce, and humanity owe to Dr. Pym, to whose talents, sagacious observations, persevering industry, and research, is due the undivided merit of having been the first who steadily investigated, and boldly promulgated to the public and the profession, this singular and now well established property of the Bulam fever.

We have, &c.

(Signed)
Louis, *President.*
Jayme Ardebol.
Gaspar Mathews.
John Rouvier.
Alex. Broadfoot, M.D.
Inspector of Health and Principal Medical Officer.
Edward Dow.

(Signed)
Frederick Dix.
Joaquim Bobadilla.
Trousseau, *Rapporteur, D.M.P.*
David Barry, M.D.,
Reporter and Vice-President.
J. D. Thurston.
Dr. Chervin }
Mr. Fraser } *Dissenting.*"

This character of the yellow fever, viz., that of its attacking the human frame but once, being established, the peculiarity of it being a disease *sui generis* and infectious is also confirmed, and decides the controversy as to the yellow fever and the remittent or marsh fever being the same disease. The first disease, the yellow or Bulam fever, from the delusion so long existing in the minds of medical men, was supposed to be only a higher grade of the marsh fever, and on this account not supposed to be infectious or contagious: hence all the misery and mortality, and which has never been more strongly exhibited than in the case of the "Eclair." This vessel, however, from the peculiar circumstances attending her, I sincerely believe will be the means of throwing much light upon the subject in question, and will prove the medium through which the unfortunate controversy will be ultimately and finally settled. For it is evident that two different diseases, the yellow or Bulam fever, and the marsh or remittent fever, existed on board the "Eclair" at different times and during distinct periods.

It has been stated, p. 5, that the "Eclair," when at anchor off the coast from the month of January to the 10th of June, lost ten men from the well-marked remittent fever. The only individuals in the ship who were attacked by it having been from among those who had been employed on boat-service up the Sheabar River; and it must be remarked that not one of the fatal cases was attended with the discriminating symptom of black vomit; neither did it show any infectious or contagious power, as it was not communicated by the sick to any others of the crew. All the cases occurred between the 3rd of April and the 8th of June—the date of the last attack of this marsh or river fever.

From this time the "Eclair" continued free from disease until the 23rd July, on which last day she sailed from Sierra Leone (where she had been at anchor eighteen days) having only one seaman suffering from fever; this man had been on shore on leave of absence, and died the fourth day after sailing with the marked symptom of black vomit; he was the first individual in which this symptom appeared from the time of the arrival of the steamer on the coast of Africa. This new fever, however, spread rapidly amongst the crew; three men who had also been on leave on shore having in a few days, as well as a passenger (Mr. Dawson), died with the same symptom of black vomit. Thirteen deaths took place before the "Eclair" reached Boã Vista, most of them dying with the same fatal symptom which continued to show itself until the arrival of the vessel in England. This proof of the existence of two very different diseases is a melancholy confirmation of the dreadful loss of human life which might have been saved if the nature of the disease had been known. I have endeavoured for a great many years to put the profession right upon the subject, and I sincerely hope that I have at last succeeded through the medium of the unfortunate "Eclair." It will now rest with those in authority to establish measures of precaution against the disease, which is far more to be dreaded than the plague; by neglecting or declining to do so, they will incur not only great responsibility but culpability.

I have, &c.
(Signed) W. PYM.

The Hon. W. Bathurst,
&c. &c. &c.

DR. M'WILLIAM'S REMARKS

ON

DR. KING'S

"Report on the Fever at Boa Vista; ordered by the House of Commons to be Printed, 10th March, 1848."

LONDON:
JOHN CHURCHILL, PRINCES STREET, SOHO.
1848.

INTRODUCTION.

Some time after my return to England from the Cape de Verds, in the month of September, 1846, I learnt from my friend, Mr. George Miller, of San Nicolao, that fever had reappeared at Boa Vista shortly after my departure from that island.

I at once transmitted this information, with an offer of my services, to Sir William Burnett, Director-General of the Medical Department of the Navy, requesting that he would allow me to resume the investigation, and again obtain permission of the Lords of the Admiralty to send me out to Boa Vista in a man-of-war steamer, then about to proceed to the western coast of Africa.

On this occasion, however, it was resolved, and I presume properly, that another officer should be employed to conduct the inquiry, and render whatever assistance might be necessary to the inhabitants of Boa Vista. Dr. King, Inspector of Hospitals, was selected to perform these duties; and upon the result of his labours, embodied in a Report lately presented to Parliament, I find myself called upon, in consideration of the importance of the question as to the infectious or non-infectious qualities of the Boa Vista epidemy, to make the following remarks.

Those who have taken an interest in the history of this epidemy, will, I trust, have seen that, in the spirit of a similar eager search for the truth, the same field of inquiry has been trodden over by Dr. King and myself; and that we have both, so far as the primary outbreaking of the disease is concerned, arrived at nearly the same facts, although our conclusions therefrom are wholly opposed to each other.

The final adjustment of this important question remains with the public, who are now, it is to be hoped, in possession of information sufficient to enable reasoning and impartial men (whether contagionists or anti-contagionists) to determine whether the late epidemy at Boa Vista was imported thither by the "Eclair," or was a disease of local origin on that island.

J. O. M'William, M.D.

London,
14, Trinity Square, Tower Hill;
April 10th, 1848.

REMARKS.

The main points on which Dr. King and myself are at issue regarding the Boa Vista Epidemic, rest, not much upon any difference of opinion as to a certain series of events having occurred at that island, at a given time, and in a definite order, but chiefly upon our respective views relative to the causes in which those events originated.

Thus, we are both agreed that the island of Boa Vista was in a condition of the most perfect health when H.M.S. "Eclair" arrived there, on the 21st of August, 1845, with a fever-stricken crew; that upon the sick being landed and lodged in a fort, on a small island about half a mile from Boa Vista, the fever increased instead of becoming diminished in intensity; that the sick were re-embarked in the "Eclair" on the 13th of September; that, during the occupancy of the fort by the sick of the "Eclair," there was a small Portuguese guard stationed there, which was several times relieved; that the guard, at the time the "Eclair" left, consisted of one negro and two European soldiers; that, within three days after the departure of the "Eclair," both Europeans were attacked with fever, similar to that from which her crew had suffered, of which they both died in the course of a few days; that the negro, Miguel Barbosa, was also soon afterwards affected with fever, and on that account, he and another negro soldier, called Pedro Manoel (who had been sent from Boa Vista to nurse the sick Europeans), were removed from the small island to the island of Boa Vista, where, from fear of infecting their comrades, they were not received into the barracks, but lodged for some time in a house situated at one end of Porto Sal Rey;* and, further, that a convict woman (Degrādādo), called Anna Gallinhā, who lived next door to that very house, was the first person who was attacked with, and died from, fever in the town.

Here, then, as regards the soldiery, we have a series of occurrences following each other in regular order, from the time the sick of the "Eclair" were landed at the fort on the small island, up to the period of the survivors of the guard being removed to Porto Sal Rey, including also that of the appearance of fever in the town.

But what in the meanwhile was passing in another part of the island of Boa Vista?

Dr. King and I both state, that Luis Fortes Pathi, who had been a labourer on board the "Eclair," was the first person, on the island of Boa Vista, attacked with fever (at least so as to attract notice), and that he was seized while attending the festival of the Holy Cross, in a village called Moradinhā, situate in the ravine of Rabil. Dr. King thinks that this man was taken ill on the day after the "Eclair" sailed (Sept. 14th). But from a rather close examination of the man himself, and from what I heard from the "Administrador do Concelho" and others, there seems more reason to believe that he was not attacked until the 17th of that month. As regards the main question, the difference of three days is, I presume, of no moment.

I think, then, it may be fairly assumed, that the opinions of Dr. King and myself are the same, with regard to this portion of the preliminary history of the epidemy, and (what is of great importance) to those who were the first subjects of fever, not only on the small island, but also on Boa Vista, both at Moradinha and Porto Sal Rey.

To this extent, then, are our premises identical, and the starting-ground of inquiry clear. It now remains to be determined which of our conclusions

* Consul Rendall, in his Diary, Sept. 24th, 1845, says, "It is reported to me that the two sick coloured "Portuguese soldiers at the fort on the small island have been brought to one of Mr. Martine'ssmall houses "near the beach of Sal Rey." This date quite agrees with what I learnt from the soldiers themselves.—*See Dr. M'William's Report*, p. 24, q. 240.

is borne out by a careful examination of the main events that arose during the whole progress of the epidemy throughout the island of Boa Vista.

Premising, then, that in this, as in all similar investigations, although much light may be thrown upon the nature of the disorder during its ulterior progress, it is to the first cases of the epidemy that we look for the commencing link in the chain of that process by which we may trace out its true history, and ascertain the properties with which it is endowed, I shall begin by considering the circumstances connected with the death of the two European guards at the fort.

And here, I think it may be safely asserted that, throughout the whole history of yellow fever, nowhere, not even at Ascension, have its properties been discussed on grounds in every respect so favorable for arriving at a positive result.

In all former controversies regarding the importation of yellow fever, the battle ground has been a large and populous city, generally a seaport town, where arguments, derived from doubts as to the previous absence or presence of disease, the varied types and modes of living of the inhabitants, the effects of tidal harbours, putrefying cargoes, and animal and vegetable matter of all kinds, in short, endless influences, real or imaginary, have been enlisted into the service of the discussion, and employed with an earnestness, that gave evidence of the zeal, if not always of the judgment, of the parties engaged.

Here, fortunately, we have no such complications. We have to deal with a narrow strip of rock, within half a mile in length, and rarely tenanted by more than three individuals.

Corporal Agosthino and Private Roque were the first, in fact, the only European guards, who were sent on duty at the fort, while the sick of the "Eclair" were there. They were both young men, and had arrived in the Cape de Verds from Portugal, their native country, in the month of August, 1844. On the 8th or 9th of September, 1845, they were ordered on duty at the fort on the small island; on the 15th or 16th, they were attacked with fever, and on the 21st of the same month they were both dead. How are these startling facts to be explained? The proposition is plain and unmistakeable. Two soldiers, in sound health, go from an island everywhere healthy, to another island where there are many sick, and some dying daily. They also sicken and die.

Dr. King, with reference to these men, says (Report, p. 6), "both men "were pre-eminently exposed to the attack of endemic fever, as they were "Europeans, and had but lately arrived in the colony." Granted: but where was the endemic cause?

It is, I believe, generally, if not universally, admitted that the endemial source of fever in warm climates is the entity called "Malaria," for the development of which certain conditions of soil and of atmosphere (which I need not here recapitulate) are essential. By the concurrent testimony of the late Mr. Macaulay, the Hon. Mrs. Macaulay, Mrs. Pettingall, and every one else with whom I spoke on the subject, the weather was never more beautiful than at the period in question. An extract from Consul Rendall's Diary, which that gentleman sent me some time back, states—"September 13th, 1845, "'Growler' and 'Eclair' left for Teneriffe or Madeira, en route for England; "warm in the sun, but with it cool breezes. The weather has been of this "description from the arrival of the 'Eclair,' and to the date of her sailing we "had no rain." . . . "So late in the month as from the 25th to the 30th of "September, is reported 'as cool.'" No mention of rain is made (and it is particularly noted) until the 5th of October. Captain Buckle's evidence as to the state of the weather during the week he was at Boa Vista, is to much the same effect. He says, "the winds were NE. to N. by E., sky always *b. c.* "A little rain fell once or twice during the night while we were there." Dr. King, indeed, nowhere in his Report ventures to invoke the aid of malaria earlier than the *end of September or beginning of October*. His words are, "concurrent circumstances have led me to the conclusion, that at the end of "September or beginning of October the atmosphere had become vitiated and "malarious." (Report, p. 7.) Dr. King evidently sees no chance of establishing the existence of anything like a *general* endemial cause at this period; but, before abandoning it altogether, he offers a conjecture which I imagine is too vague to have much weight in a philosophical inquiry. He says (p. 12), "whether the common atmosphere possessed any latent epidemic property at "this time I know not."

Was there any endemial source of disease within the fort? Dr. King, with reference to the fort, says (p. 11), "Inside the door on the left, "I observed the dusthole, similar to the receptacle for manure near the "stables and mews of London, which was then (Jan. 16th, 1847) two thirds "full of rubbish, probably the accumulation of years; and in the opposite "corner of the court there were two common close privies." Again, in accounting for the increase of mortality among the "Eclair's" sick at the fort, Dr. King observes (p. 12), "As I am fully persuaded that the crew of the "'Eclair' had been exposed for a length of time to the influence of some "deleterious miasma generated in the ship, and which, by a combination of "causes, had become highly concentrated, the melancholy occurrences at the "fort may, I think, be rationally explained, without referring to the agency of "contagion." Possibly they may, as far as the "Eclair's" are concerned; but the deaths of the two soldiers, who (according to Dr. King's account, and that of every one else) never had been on board the "Eclair," were also melancholy circumstances, which require to be rationally accounted for.

In my Report (pp. 78, 105) I have stated my reasons for supposing that there was nothing malarious or endemial at the fort, or anywhere on the small island; and, as unconnected with the sick of the "Eclair," Dr. King has supplied nothing beyond the dusthole and the privies, which, by the way, are not, like endemial influences, the products of season, but of causes always in operation. Both of us speak of the closeness and bad ventilation of the lower part of the house, in which there was a portion of the sick, which were circumstances doubtless favorable to the propagation, if not to the exaltation in character, of yellow fever, but hardly of themselves capable of originating it. Dr. King is, I imagine, much nearer to the real cause when he says (p. 11), "when the place "was overcrowded, and the clothes and bedding of the crew and convalescents "were daily exposed for the purpose of ventilation, the atmosphere which the "men breathed must have been polluted and deleterious in the extreme."*

Dr. King (p. 11) says the thermometer was 86° during the day while the sick were at the fort. Sir William Burnett, at p. 80 of 'Correspondence on Subject of Eclair,' &c., states, that while the "Eclair" was at Boa Vista the thermometer averaged 86° F.; and Dr. Stewart, at p. 88 of the same document, says the thermometer ranged from 84° to 86° F. These statements rest, I presume, on the authority of Dr. Carter, of the "Growler." If so, they do not (to be precise) represent the *average*, or the *range*, but the daily *maxima* of the thermometer during the period in question; for Dr. Carter himself informed me that his observations were made only once in the twenty-four hours, and then at 2 p.m., or the hottest time of the day. I have no wish to be hypercritical; but I have taken considerable pains to ascertain the truth, connected with the most minute points in the history of the epidemic, and I find, by an accurate computation of Captain Buckle's (of the "Growler") observations, which he very kindly sent me, taken twice, and sometimes three times in the course of the twenty-four hours (never at the coolest period), that the daily average was 81·80 F.; the maximum never reaching 84° F.

If, then, the illness and death of these soldiers cannot reasonably be attributed to endemial influences, general or local, it is evident that a cause is to be sought for elsewhere. It has been seen that they had been on duty four or five days at the fort before the sick of the "Eclair" were re-embarked; but Dr. King (at p. 6) says, "I have no reason for believing that any of the "soldiers were permitted to enter the sick apartments at the fort." Now, in a matter of such importance, surely it would have been better had Dr. King enabled himself to speak more decidedly on this point. From the examinations of the soldiers themselves (vide examination of soldiers in Dr.

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* That nothing having the semblance of a local cause may be willingly passed over, I may mention, that on the flat where the salt-pan is situate, behind Porto Sal Rey, there is a thin stratum of calcareous sandstone. Here, then, are a carbonaceous soil and the oceanic salts—elements for the formation of sulphuretted hydrogen. But those same salt-pans have been in operation from the early occupation of the island by the Portuguese, and the labourers employed at them have been always remarkably healthy men. Moreover, we can hardly imagine, even if sulphuretted hydrogen was thus formed and evolved, that the inhabitants of the town close to it could have escaped; far less can it be connected with the illness and death of the soldiers at the fort, unless indeed it be supposed that the gas at the instant of its generation acquired a momentum and progress through the atmosphere similar to that of a cannon-ball, rising behind, and describing its parabola over Porto Sal Rey, and falling upon the small island, which, singularly enough, must have been its exact point blank range.

M‘William’s Report, pp. 20 to 25), there is not the slightest doubt but that most, if not all of them were in the sick apartments. But one glance at the dimensions of the rooms of the house (Dr. M‘William’s Report, p. 78) will convince any one, upon a moment’s consideration, that to accommodate the whole of the “ Eclair’s” sick in them was a physical impossibility ; consequently, some lay under tents or sheds in the court-yard. The guard occupied a wretched shed called a cook-house, close to the lower door of the house where most of the sick lay ; some of them slept under the piazza, where they must have been trodden upon by the sick going to the water-closet. Moreover, from the small size of the whole inclosure (93 feet by 50 feet) containing so great a number of men, it was next to impossible for the soldiers, if they had been ever so careful, to avoid contact with the sick.*

As, when at Boa Vista I failed to discover the least evidence of the cause in the earth, in the air, or in anything animate or inanimate on that island, or on the small island, unconnected with the “ Eclair,” to account for the illness and death of these soldiers, so now, after a careful perusal of Dr. King’s Report, I find myself, as I was then, driven to the conclusion that these events were due to intercourse with the sick crew of that vessel.

Having, as I trust, satisfactorily shown, from a relation of facts, and even from the evidence of Dr. King himself, that this, the first irruption of the Boa Vista epidemic, cannot reasonably be attributed to any endemial cause, but that it was the result of infection from a disease imported thither by the crew of the “ Eclair,” I shall now endeavour to point out in what manner the disorder extended itself from the small island to the town of Porto Sal Rey.

It is beyond any doubt that, soon after the death of the two soldiers at the fort, Miguel Barbosa was taken ill, and was in consequence sent, with his comrade, Pedro Manoel, to a house in the Beira Row of Porto Sal Rey. It is also certain that Anna Gallinha lived in the house next to this, and that she was the first person seized with (at least, so as to attract any attention) fever, and the first who died in the town. It is further true, at all events, it remains uncontradicted, that Manoel Affonso, living twenty yards from Anna Gallinha’s house, was dead from fever on the 18th October (Anna having died about the 16th of that month), and that Gertrude Bent, who lived next door to Manoel Affonso was attacked the day after he died. Lisboa, an European writer, who also lived in the Beira Row was also seized, and died towards the end of the month. (Vide Dr. M‘William’s Report, p. 85.)

Dr. King (p. 6) says, “ The soldiers were at Beira seventeen days, and that “ he was informed by Miguel Barbosa that ‘ they held no communication’ with “ any one while there.” Dr. King here adduces Barbosa’s evidence, and I may therefore adopt the same authority to prove that the very reverse was the fact. (Vide Dr. M‘William’s Report, pp. 22-23.) I further appeal to the evidence of “ Joana Teixeira” (Dr. M‘William’s Report, p. 28), to that of Pedro Manoel (p. 24), to that of John Jamieson (p. 26), as well as to that of many others (vide evidence *passim*), to show beyond all doubt that both Joana Teixeira and Anna Gallinha were certainly with the soldiers, and that they were visited by many others while at Beira.

Dr. King (p. 6) asks—“ If the soldiers were visited by Anna Gallinha and “ others, what was the object of their seclusion, and how is the reckless con- “ duct of their visitors to be reconciled with the dread of the fever which, it “ is said, pervaded all classes ?” The object of their seclusion was obviously a precaution on the part of the Military Commandant to prevent the introduction of the fever into the barracks. It is not always that the reckless conduct of people is to be accounted for, more especially the freaks of damsels of the peculiar calling of Anna Gallinha. Her services at Beira were not restricted to nursing or cooking.

The invasion of Porto Sal Rey by fever forms an epoch (so to speak) of the epidemy, differing in one important particular from the whole of its antecedent history. By the time Anna Gallinha was taken ill much rain had fallen; the weather had become more hot, and, in short, there now (but not before this) existed the recognised elements for malarious evolution.

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* Here I may observe, there are not a few in the profession who would at once declare that, for all purposes of proving infectious communication, the fact of the soldiers being within the walls of the fort was sufficient proximity. The present case, however, rests upon much stronger grounds. An eminent medical philosopher observes, “ If a virus can be transmitted from the body through a few feet of air, we are not “ entitled, from the partial experiments hitherto made, to set any limits to the extent to which, under “ favorable circumstances, it may be conveyed through the same or other medium. Common reason “ here concurs with our actual experience of the transmission of the virus of certain diseases in various “ ways and to remote distances.”—*Dr. Holland’s Medical Notes*, &c. p. 281.

It is true, as I have already mentioned, that Dr. King thinks the atmosphere had become vitiated or malarious so early as the end of September or beginning of October. But the contagious or non-contagious properties of yellow fever must be determined by arguments less flimsy than mere conjectures. It is but right to ask Dr. King on what grounds he rests his supposition. Surely he does not mean to tell us that the atmosphere was vitiated and malarious because there was fever; and that there was fever because the atmosphere was vitiated and malarious.

At this period of the inquiry, an important question presents itself—was either the origin or progress of the fever in Porto Sal Rey in conformity with the law of diseases caused by endemial influences? To account for its origin here, Dr. King (at page 6) remarks—"There is one large pool of stagnant " salt and fresh water immediately behind, but to windward of this part of the " town (Beira); and still nearer to the houses there is a locality, which is " resorted to by many of the people when obeying the calls of nature." By a reference to the brief topographical description of Porto Sal Rey in my Report (pp. 84-5), it will be seen that the lower part of the Beira Row abuts on the beach; and that, a little way above its upper extremity, the trappean rock crops out, and forms a ridge between the houses of Beira and the salt plain to windward, where only there could have been "a pool of fresh and salt " water." But the chief depot of fresh and salt water is on the flat site of the salt-pan, immediately behind the main body of the town. The shallow troughs in which the salt is formed cover a superficies of between three and four thousand square yards. When the rainy season has some time set in, the greater part of the plain, as far back as the Reshee Hill, is in a state of inundation, and the broadside of the whole of the town is thus immediately to leeward of a sheet of water. With reference to the other source of atmospheric pollution at Beira mentioned by Dr. King, there are, or were, receptacles of the same kind in various parts of the town. It was to these open air "cabinets d'aisance" that I alluded in the few sanitary suggestions which I furnished to the Board of Health, at Boa Vista. (Report, p. 112.)

Here, then, as regards Porto Sal Rey, there was at this time a general prevalence of those theoretic physical conditions by which fever may be caused. But was the manifestation of the disease also general, or in accordance with the endemial law? Most assuredly not. It was the very reverse; for it was for a considerable time strictly local, being confined to Beira and its immediate neighbourhood. It is, surely, attributing too much to mere chance to suppose that an endemial cause should spare the inhabitants of Porto Sal Rey only so long as the soldiers kept away from the town; that it should select for its operation, in preference to all others, the very locality, nay, the very house, in which those soldiers were lodged; and that it should still further maintain its extraordinarily capricious character, as to mark out for its first victim the very woman who cooked for them.

The non-appearance of the disease in Porto Sal Rey for so long a time, which has been so particularly remarked upon by Sir William Burnett (chiefly on the authority of a letter of the Governor-General in the 'Gibraltar Chronicle'),[*] is thus easily accounted for, and argues incontestably for its

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[*] Those who wish to consult the letter of the Governor-General, will find the extract, taken by Sir William Burnett, at p. 5, Dr. M'William's Report, &c. The letters of the late Mr. Macaulay and Consul Rendall are to be found at full length at pp. 35 to 40 of "Correspondence on the Subject of the Eclair, presented to Parliament." I must own, I cannot but share in the surprise manifested by some journals, that Sir William Burnett, in commenting upon my Report, should, after reading the evidence submitted, and without expressing any doubt of its having been honestly and correctly taken, persist in the immunity of the island from fever for a month after the "Eclair" sailed.—*Vide Letter to the Secretary of the Admiralty*, p. 3, *Dr. M'William's Report.*

Whatever were the Governor-General's first impressions, or the doubts of the late Mr. Macaulay and Mr. Consul Rendall, as to the origin of the disease at Boa Vista, it is quite clear that after due reflection they saw the matter in its true light. That estimable and accomplished man, Mr. Macaulay, is now no more; but his public letters, as well as those of Mr. Rendall, point to the Beira Row house as the spot where fever broke out in the town. In an extract from a letter which Mr. Rendall sent me some time back, he is more explicit on this head. He says, "I have not yet received your Report . . . Doctors may " differ, but I cannot see why a plain story should not be listened to, and appreciated as all true ones ought " to be. The late fever at Boa Vista came from the small island to the town in the persons of the two introduction to the town by the sick soldiers from the fort. For it is quite certain that the fever did not show itself until (and it is to be marked not until) the soldiers came to Beira.

It would, indeed, be tedious here to recapitulate the whole of the evidence in my Report, proving from high and low that the fever in Porto Sal Rey broke out in the person of Anna Gallinha; radiated from her house to those in the immediate neighbourhood, and ultimately extended over the whole town; or, in other words, that its rise and progress were in harmony with the laws which regulate contagious disorders.

If I have succeeded so far as to have established that the Boa Vista epidemy originated on the small island not from any endemial cause, but from intercourse with the sick of the "Eclair"—that its introduction into Porto Sal Rey was also due to the arrival of the soldiers from the fort at Beira,—and that it spread over the town from that quarter, I might here stop, and say that, as far as infection is concerned, the question is set at rest. If the disease was infectious on the small island and at Porto Sal Rey, *a fortiori*, it was infectious everywhere else on the island of Boa Vista. As, however, it may be more satisfactory to follow up the disease in its course throughout the island, I shall now proceed to consider the circumstances connected with the labourers who were employed in the service of the "Eclair."

And here I must, with every respect for Dr. King, correct a grave error into which he has fallen, the influence of which is apparent in his Report throughout, in supposing that the circumstance of exposure to whatever morbific influences may have been on board the "Eclair," or at the fort, were exactly the same in the persons of the soldiers and labourers. He says (p. 6), "How did it happen that the disease (if contagious) was not introduced " into the town at an earlier period by the labourers, who were quite as much " exposed as the soldiers to its presumed fatal influence, and were daily em- " ployed from the 1st until the 13th September, associating freely with their " acquaintances, and sleeping every night in their own houses in the town?"

Now, instead of the "labourers being quite as much exposed as the soldiers," &c., it is hardly possible that two bodies of men could have held positions more diametrically opposite to each other than they did, with reference to the "Eclair" and the sick crew at the fort. *No labourer* (with the exception of Portajo, the slave who died) ever was within the walls of the fort,* although some were at the gate to get water, while the "Eclair" was there; but most, if not all, of the labourers were at one time or another on board the "Eclair." On the other hand, *no soldier* was at any time on board the "Eclair;" but all those who composed the several guards were, of course, in the fort with the sick. It clearly follows, then, that the labourers were exposed to whatever sources of disease there may have been on board the *vessel*, but not to those that existed at the *fort;* while the soldiers, on the contrary, were rendered liable to whatever morbific cause there may have been at the *fort*, but not to any that may have been on board the *vessel.*

The labourers, as may be seen by a reference to the tables in my Report, belonged chiefly to the villages in the country; and the mode in which I obtained, and afterwards thoroughly sifted, their evidence may be here very briefly stated. Those belonging to a particular village were examined, and their evidence carefully set down, in the house of the late Mr. Macaulay, at

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" affected soldiers, and was communicated from them to the people of Porto Sal Rey, and from them to " the other parts of the island; of this I am ready to prove the fact."

But this is not all. The opinions of his Excellency the Governor-General, upon a calm review of the facts of the case, have undergone a complete change. In December 1846, his Excellency, in reply to a letter from Dr. King, pronouncing his opinion that the disease was of indigenous origin, says, "Regarding " the difficult question of deciding if the disease be contagious or have a local origin, I cannot give my " opinion; but what I can say, and of what I am well informed, that never a fever with equal symptoms " visited these islands before the arrival of the unhappy 'Eclair' at Boa Vista. The fevers that are in- " digenous, or have a local origin, are called by the doctors at Villa da Praga (San Jago) '*miasmaticas*,' and " in the other islands, the gastro-enteritis, and these are of a very mild character; but, unfortunately, they make " their appearance every year in the rainy season." In a letter to me, dated January 1848, his Excellency says, "You now see I have changed my first opinion. I am quite convinced that the fever was contagious, and " that it was introduced into Boa Vista by Her Britannic Majesty's ship 'Eclair.'" Long before his Excellency wrote to Dr. King, he stated in a letter to my friend Mr. Geo. Miller, of San Nicolao, "I am " not learned in these matters, but I am convinced the fever was contagious from its commencement, and " during its progress over the island."

* I here speak exclusively of the labourers and soldiers. Dr. Kenny and Dr. Almeida were both at the fort to see the sick crew. A man called Jose Pedro Pons, brought supplies from the country, and was strongly suspected of introducing spirits into the fort. John Jamieson was also frequently in the fort.

Porto Sal Rey. This being done, I proceeded, accompanied by John Jamieson, to the village, Rabil, Estacia, or as the case might be; and then again interrogated the more intelligent portion of its inhabitants, especially those living in the houses where fever first occurred. Both accounts, thus procured, were rigorously compared with the information given me by Dr. Almeida and others in Porto Sal Rey. This mode of investigation doubtless involved much patience and labour among a class of people not much accustomed to mental exercise; but I am bound to say that their statements tallied in every essential point with those of the higher orders at Boa Vista, as well as with the information which has since come to light from Consul Rendall and other residents on the island.[*] In the absence of strong evidence to prove actual dates, I preferred setting down, as near as I could arrive at, the number of days that elapsed after some circumstance (for instance, the Feast of the Holy Cross, September 14) sufficiently remarkable to connect the period of its happening with that of what I was recording. To have received dates on all the occasions on which they were offered me, I soon found would have given my Report the semblance, without the reality, of perfect accuracy.[†]

It is now time to return to the labourer Luis Pathi, who was left sick at the village of Moradinha. I considered the real facts of this case of so much importance, that the evidence was not finally recorded in my note-book for several weeks, in order that it should be verified by ample corroboration. This man was attacked on or about the 17th September, 1845, and remained at Moradinha nearly a week, when he was taken to his house, in that part of Rabil called Cabeçada. It is quite certain (vide pp. 42 to 55, Dr. M'William's Report) that he was the first person who had fever in Rabil, where he must have arrived about the 25th September. In the beginning of October one of his daughters was taken ill, and died in three days. Four days after she died, another daughter was seized, and she also died. Eight days after the second girl died, his son was attacked, and lived only five days. Lastly, his wife was struck down on the day, or the day after, the boy died; but in her case the fatal termination was protracted until the fifteenth day of her illness; so that her death did not take place until the beginning of November. Meanwhile the wife of Manoel Fachina, Fachina himself, and his two children, had been attacked,—the first in September, about the end, and the others early in October. (Dr. King's table, October.) Manoel de Silva Marques, early in October. (Dr. King's table, with reference to this man and his family, October and November.) Joaquim Marques, between the 8th and 12th October. (Dr. King, 25th October), and the rest of his family all in the same month. Joaquim Pathi, about the 10th or 12th October. (Dr. King, October.) Manoel Rosa, about the same time as Joaquim Pathi. (Dr. King, October.)[‡] All these men, with their families, lived near to Luis Pathi; and it is unnecessary further to trace the radiation of the fever from this to the other quarters of Cabeçada.

Dr. King, as well as myself, saw the importance of Luis Pathi's case. At page 5, he says, after stating the successive attacks and deaths in the family, "It is not unlikely that the above facts may be considered by some as "illustrative of the operation of a specific contagion, but for my own part "I have yet to learn when and where the man himself was ever within the "sphere of its influence." Luis Pathi was for a day on the "Eclair's" lower deck, pumping water. There was strong suspicion of his having taken a coverlet belonging to one of the officers of the ship; above all, he was on board the day the sick were re-embarked from the fort, and assisted in hoisting them in. It may be said there were others on board at this time who were not attacked when Luis Pathi was. It is answered, that Luis Pathi's case bears every evidence of being a positive instance of infection, which is not to be controverted by any number of mere negative results.

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[*] I had not the pleasure of seeing Consul Rendall at the Cape de Verds, as he was at the island San Antao; nor had I had the advantage of perusing his letters until after my Report was given to the Admiralty. The Report, as it was written on the spot, was presented a few days after my arrival in England.

[†] I cannot account for the difference between Dr. King and myself as to the aggregate number employed. Dr. King's table gives a total of 63 men, including those that died; while my Report contains the evidence of at least 70 survivors, who at one time or another were in some way employed in the service of the "Eclair." The men were called before me by the lists, in possession of Joao Baptista, Senhor Carvahal, and others, by which the men received their wages.

[‡] In Dr. King's table this man is called Manoel Boavista, but I have no doubt we both mean the same man, from the fact of his being, according to both accounts, employed in the launches, and for the unusually long period of fifteen days.

Dr. King, with reference to Luis Pathi, observes (p. 5), "If there is " one spot more than another in the whole island where, from its physical " peculiarities, endemic fever might be expected to begin first and end last, " that locality is Moradinha and the villages in its vicinity, in one of which " Pathi resided."

Those who take the trouble to read the brief topographical description of Rabil and Moradinha, in my Report, will find that our opinions are identical as regards these localities being physically favorable to the development of fever poison. But how far is the theoretic view of the subject borne out by actual facts? Fever broke out in Moradinha at a season of the year when there was nothing like any appreciable, local, physical condition to produce it. When fever was raging at Rabil, high above the ravine, there were only two persons at all sick in Moradinha, which lies almost in its bed. Again, Estacia de Baixo, which all the year round overlooks, and is nearer to, the site of the swamps, in the lower end of the ravine, than any other part of the island, suffered least of all from fever; for, in a population of 256 persons, only three deaths took place, while the average mortality throughout the island was 1 in 15·4. Again, when fever reappeared at Moradinha, it was at that season when malaria, theoretically, ought to have been least rife.

Appearance of the Fever in Estacia Velha (*Old Town.*) The periods mentioned by Dr. King and myself are the same as to fever appearing in this village. Senhor Nicolao Tavares' evidence is clear as to the importation of the disease by João Chico Fernandez and his sister Libania, who arrived in the village sick from Rabil. Senhor Tavares, the patriarch of the village, was a most respectable man, who could speak and write English, as well as other languages, well. His evidence corroborated that of others when examined on the subject. (Vide evidence, p. 57, Dr. M'William's Report.)

Estacia de Baixo. This place, remarkable for the small mortality from the epidemy, is not spoken of by Dr. King; therefore I would refer to p. 90 of my Report for the details.

The Eastern Villages.—João Gallego, Fundo das Figueiras, and *Cabeça dos Tharafes.*

With the exception of Fundo das Figueiras, Dr. King and I quite agree as to the time when those villages were respectively invaded by fever. *Cabeça dos Tharafes* was infected by Captain Aniceto's daughter, as I ascertained on the spot; and afterwards was confirmed in the information by Dr. Almeida. (Vide evidence, Dr. M'William's Report, p. 76.) *João Gallego* was perfectly healthy until the arrival of two sick soldiers from the barracks in Porto Sal Rey. (Vide evidence, Dr. M'William's Report, pp. 33-6, 76.)

The following table shows the periods at which the different districts were invaded by fever, according to the Reports of Dr. King and myself respectively.

NAMES OF PLACES.	DR. KING.	DR. M'WILLIAM.
Fort on small island	Sept. 16th or 17th, 1845.	Sept. 16th or 17th, 1845.
Porto Sal Rey.	About October 12th.	Oct. 12th.
Moradinha.	Sept. 14th.	Sept. 17th.
Rabil—Cabeçada.	About October 14th.	End of September.
Boaventura.	Not mentioned.	Nov. 15th, 1845.
Estacia Velha.	Nov. 15th, 1845.	About Nov. 15th.
Estacia de Baxio.	Not mentioned.	End of November.
Eastern villages:		
Cabeça dos Tharafes.	October 27th.	End of October.
Fundo das Figueiras.	October 31st.	Nov. 19th.
João Gallego.	Nov. 1st.	Nov. 1st.

On glancing over the above columns, it will be evident that we nowhere differ in the periods of the invasion by fever of the several districts in the island, so as at all to affect the question at issue. Dr. King and myself both notice particularly the fact of Estacia Velha and the other distant villages continuing so long healthy, while fever was raging elsewhere on the island; but our conclusions therefrom are perfectly opposed to each other, Dr. King regarding it as a proof against contagious propagation, while I consider it a circumstance highly in favour of such a view. Dr. King says, "Circumstances "have led me to the conclusion, that at the end of September or beginning of "October the atmosphere had become vitiated and malarious" (p. 7); "the common atmosphere was unusual and epidemical" (p. 8); "the common air in October, November, and December was in an epidemic constitution" (p. 9).

Now, had the epidemy at Boa Vista originated in a cause so generally diffused as the common atmosphere, it is, I imagine, but right to expect that its appearance in the various districts should have been somewhat general and simultaneous, instead of its being, as we both admit, confined for periods to certain localities. Again, the supposition of there having been any general "latent" atmospheric vitiation cannot be reasonably entertained; seeing that all the other islands of the group (within sight of each other) remained in their usual health. In my opinion, all that can be granted is this: that, at Boa Vista, a considerable time after fever broke out, there existed the theoretic physical conditions to generate *malaria;* therefore malaria may have been produced; if so, it must be allowed that the atmosphere may have then become in a state favorable to the *propagation* of the disease.

To this extent, then, the postulate is admitted; but its corollary is not on that account to be largely or hastily adopted: for it is by no means free from exception. It has been seen, that the fever could not only arise but that it could spread without the aid of malaria; where malaria ought to have been most rife there was least fever; and in the town of *Ribiera Brava,* in the neighbouring island of Nicolao, I saw the elements for malariac production in as great perfection as anywhere at Boa Vista, yet San Nicolão was healthy, while at the same time fever was raging at Boa Vista. If, in short, it has been satisfactorily demonstrated that the Boa Vista epidemy did not owe its *origin* to malaria, it follows that its diffusion over the whole island may also have been perfectly uncontrolled by it, or by any other supposed abnormal atmospheric condition.

There is another species of evidence, generally recognised as of some value in an inquiry of this kind, which Dr. King has not noticed. I mean the negative evidence derived from the isolation or segregation of healthy individuals, from infected districts. At *Espinguera,* near Mount Broyal; at *Cantor,* near Mount Ochello; at *Agua dos Caballos,* situated little more than a mile from Cabeça dos Tharafes (where, as the name implies, are the elements for a local febrific cause), I saw so late as in May 1846, little colonies, amounting in all to fifty-one persons, who, in the early period of the epidemy, had fled from João Gallego, and other villages, and cut off all communication with them. Not one that remained was attacked. No one, they said, had had fever, "Gracias a Deos." (Vide Dr. M'William's Report, pp. 107-8.)

Dr. King (p. 4) seems doubtful as to the symptoms having been so violent as represented. It is quite in accordance with all experience, that in yellow fever, as well as in other tropical diseases, the symptoms are less strongly marked among the negro and mixed races than among the whites. However, judging from the mortality, they must have been violent enough to satisfy the most fastidious on this head.* The average mortality among the whole native population, slaves and free men, was 1 in 15·4. Of 56 European Portuguese who remained on the island, 25 died. Out of 11 English and Americans, 7 died. In the barracks the whole force consisted of 41 rank and file, of whom 9 were European Portuguese, the rest natives of the Cape de Verds, chiefly negroes. Of the 9 Europeans, 8 died: the last 6 at the barracks all within three weeks. Had the general population consisted of Europeans instead of negroes and mulattoes, the calamities must have rivalled, if they had not exceeded, the dreadful mortality of the "Eclair."

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* I owe to the great kindness of Mrs. Pettingall the following painfully graphic picture of the disease that proved fatal to her husband and daughter. "A few days after our return to Boa Vista from San Nicolao, we found out, alas! too late, that the fever had been raging all the time we were away. In a few days my servants were taken ill with fever. On the following Monday my beloved daughter got up as usual, but did not care for her breakfast, and in an hour or two complained of pain in her head, and lay down upon the sofa. Very soon she had dreadful pains in her back and legs, when she was put to bed, from which she never rose, except to be moved in it from one bedstead to another. Dr. Kenny attended her until the time of her death. Her head was sometimes confused, and her eyes looked very bad [the red eye glaired, as it were, with a coating of thin mucilage, so remarkable among the blacks I saw.—J. O. M'W.]—I bathed her head and arms with vinegar and water. Poor dear! she lay for days perfectly unconscious of her danger, scarcely complaining or asking for anything. Sometimes she would express a wish to be drawn in her bed into the other room. I still resolved to hope; but on the Thursday the poor sufferer complained of sickness, and shortly threw up a dark mixture like blood and slime. All hope from that time passed away. I was obliged to keep clothes under my dear child's head, as her mouth was constantly filling with the gulpings of black vomit; after this she was but little sensible; and on Sunday, after asking to see her father, she was soon seized with convulsions—her screams were terrible; but in mercy the Almighty gave her ease and rest for some hours before he took her to himself."

There is yet another statement in Dr. King's Report that requires to be noticed, before these remarks are brought to a close. Dr. King (p. 4) says, "All persons with whom I conversed, except Dr. Almeida, insist on it as a fact "not to be doubted, that the fever was imported by H.M.S. 'Eclair,' and "therefore its origin was not to be referred to Boa Vista, nor any of the other "islands. Dr. Almeida considers the disease to have been an aggravated type "of the bilious remittent."

To this I shall, without comment, refer to my Report, in which is recorded Dr. Almeida's opinion as to the origin and nature of the epidemy, eight months *previous* to Dr. King's visit to Boa Vista; and append a letter of Dr. Almeida, written *six months after* Dr. King left that island.

Dr. M'William's Report. Dr. Almeida's Examination, April, 1846.

Q. 1561. What was the disease with which the crew of the "Eclair" were at this time (at the fort) affected?—Yellow fever.

Q. 1562. Have you often seen this disease before at Boa Vista?—Never.

Q. 1540. How long have you been on this island?—Thirty-seven years.

Q. 1567. What was the nature of the disease (that from which the inhabitants of Boa Vista afterwards suffered)?—The same as that which the crew of the "Eclair" laboured under when I saw them at the fort.

Mr. Geo. Miller, Boa Vista, June 30th, 1847.

I have before me your esteemed letter, in which you request from me my professional information, as a resident in this island since the year 1809, upon the sanitary state of it, from that time until the appearance of the yellow fever, in 1845. In reply to which, I have to inform you that I have resided in this island thirty-eight years, as the only medical man of the place. I have treated the inhabitants of this island, of all and whatever sicknesses with which they have been attacked, and it has never come to my knowledge that contagious fevers have been introduced into this island, nor have originated in it; but only fevers "miasmaticas," exhibited with intermittent and remittent symptoms, which only took place some years in the rainy season, from the effect of stagnant water in the ravine of Rabil, and attacked the people living in the neighbourhood thereof, whilst those in the other villages were exempt. It was only in the year 1845 that I have known in the island the contagious or yellow fever, which, unhappily, was introduced by Her British Majesty's steam-vessel "Eclair," and to such an extent devastated this unfortunate people."*

(Signed) H. J'Xavier de Almeida, *Licensiado.*

I may add that I have a letter from Dr. Antonio José Nunes, surgeon of the artillery at San Jago, who was for some time at Boa Vista, during the epidemy, to the effect that the disease was a yellow fever, imported by H.M.S. "Eclair," and quite different from those fevers which he sees every year at Villa da Praia.

I think, then, that the whole tenor of the evidence furnished regarding the Boa Vista epidemy fully bears out the following conclusions, viz.:

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* My friend, Mr. Geo. Miller, to whom this letter is addressed, is a merchant trading extensively between Bristol and the Cape de Verds, residing at San Nicolao. He is a highly educated and accomplished man, to whom I am under great obligations, not only for his kindness and hospitality when I was at San Nicolao; but also for valuable information before and since my return from these islands. Mr. Miller has employed much labour and industry in investigating the Boa Vista epidemic, which, from very peculiar circumstances, was to him a subject of melancholy and painful interest.

1. *That the epidemy did not arise from any endemial source.*

a. Because fever appeared before any of the commonly recognised conditions to produce endemial causes existed.

b. Because, even after these supposed endemial conditions existed, where malaria ought theoretically to have been most rife, there was least fever.

2. *That the epidemy did not depend upon any general atmospheric vitiation.*

a. Because the whole of the other islands (which are within sight of each other, and all within the trade-wind influence) were, when fever raged at Boa Vista, in their usual health.

b. Because the manifestation of the epidemy was in no degree general or simultaneous, as it ought to have been, if it had been owing to a cause so diffused as the common atmosphere, but was confined for long periods to certain localities, while other districts were wholly exempt from the disease.

3. *That the Boa Vista epidemy is an instance in the history of yellow fever, in which that disease is proved to have been imported into, and afterwards diffused over an island, by virtue of infectious properties.*

a. Because Boa Vista was perfectly healthy until the arrival of H.M.S. "Eclair" there, with a fever-stricken crew.

b. Because fever of the same nature as that which afflicted the "Eclair" appeared among the inhabitants of Boa Vista, within a reasonable time after her departure from the island, and first in the persons of those who had been in direct intercourse with the sick crew.

c. Because the progress of the disease from one district to another, and from person to person, was, in every case, clearly traced to communication with infected individuals.

d. Because isolation of healthy persons in places remote from, as well as in places near to, sick villages bestowed perfect immunity upon those who were thus segregated.

P.S. It is to be regretted that Dr. King has not furnished some account of the cases of fever that occurred at Boa Vista shortly after my departure from that island, which would not only have enabled me to bring forward the results of my indefatigable friend Mr. Miller's investigation of the outbreak of that period, and subject them to a rigorous comparison with those of Dr. King, but would also have rendered the history of the epidemy much more complete.

Some detail of the cases at this period would, in my humble opinion, have formed a more fitting termination to Dr. King's Report than the notes regarding the fever at Bermuda; seeing that he was not writing a treatise on yellow fever, or an account of the geographical distribution of that disease, but a Report of the fever at Boa Vista, to which I would deferentially submit he had better have confined himself.

We should at this moment have been far nearer an adjustment of the disputed points in the yellow-fever controversy, had the narrators of the many epidemies of that disease contented themselves with a statement of plain facts, and for the time dismissed from their minds all hypotheses, theories, and analogies; had they, in short, pronounced a verdict upon each epidemy solely upon the evidence which the particular case afforded.

While I thus take leave to question the propriety of Dr. King's introducing the subject of the Bermuda fever on this occasion, I should nevertheless be very glad to see a concise account of that epidemy published, and Dr. King is of all men best calculated to do the subject justice. He who was so prominently and usefully engaged during the whole prevalence of the Bermuda epidemy is well worthy to become its historian.

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CHOLERA IN JAMAICA.

Copy of a LETTER from C. Macaulay Esq., Assistant Secretary to the Board of Health, to F. Peel Esq., Under Secretary of State.

The General Board of Health, Whitehall,
March 1, 1853.

Sir,

In reply to your letter of the 7th ult., with reference to the report of Dr. Milroy on the recent Cholera Epidemic in Jamaica, I am directed to state, for the information of the Duke of Newcastle, that among the circumstances of permanent interest connected with the history of this epidemic the following appear to the Board to desire special attention.

The evidence detailed in this report fully bears out the melancholy statement, that the violence of this dreadful visitation, the loss of life it occasioned, the suffering it inflicted, and the disastrous results to the industrial welfare of the colony which it has left behind, have been unequalled in any other part of Her Majesty's dominions. The evidence is equally decisive that the local causes which gave to this calamity its peculiar severity arise from no inevitable and unalterable conditions of the colony, but are capable, some of them, of removal, and others of very great mitigation. Some practical benefit may therefore result from bringing these conditions under consideration.

The Board are acquainted with no instance in which the poison of this plague acted on large masses of the population with similar intensity, rapidity, and fatality. It far exceeds any account which the Board have received of its severity even in Poland and Russia.

Thus, in St. Anne's Bay, while it suddenly and simultaneously broke out in different villages a few miles apart from each other without any traceable communication, the attacked were struck from the very first with death. They lay in a state of stupor, scarcely seeming to hear when bawled to, with little or no vomiting, purging, or cramps, and apparently with little suffering of any kind. When roused from their stupor the only complaint they made was of pain in the right side. If the head was raised up it rolled down, unless supported, as if there was not strength to keep it up. The pulse was gone, and even the action of the heart was not to be felt.

In St. Thomas in the East the patients fell down at once in a sort of lethargic stupor, without vomiting or purging, and sank collapsed in a few hours. Frequently there was but one enormous evacuation from the bowels, and fatal collapse ensued immediately.

In the parishes of Dorothy and Vere the epidemic, appearing at once in different and remote parts, struck the attacked with sudden and mortal collapse.

At Port Maria, within twelve hours after the first appearance of the disease between thirty and forty persons had died; there was scarcely a house in which there was not either a dead or a dying person, in several four or five, and whole families were swept off in the course of a few hours.

On the estates of St. Catherine's Hall, Irwin, and Latium, in the parish of St. James, the attacks were so rapidly fatal that able-bodied labourers while employed in the boiling-houses were seized with cramps and spasms, became collapsed at once, and speedily expired. In Port Royal many of the cases proved fatal in from four to six hours from the moment of seizure.

Such were the numbers that perished, and so rapid was the work of death, that the utmost difficulty was experienced in burying the dead. In Kingston graves could not be dug quick enough, dozens of coffins lay on the burying ground for hours at a time before a spadeful of earth could be removed, and on one occasion a corpse in a gully on the east side of the town was found partially devoured by carrion vultures.

In Port Royal and St. David's the dead could not be buried; corpses were left for days on the ground a prey to dogs and vultures.

In Dorothy and Vere the corpses lay where the miserable victims had perished until their stench had drawn vultures and hogs to the spot. When discovered they were horridly mangled; and as no one could be had to remove or bury them, the huts were set fire to and burned to the ground with the bodies within.

In Montego Bay, as in Spanish Town and elsewhere, the utmost difficulty was experienced in burying the dead. On one occasion, when there were forty bodies on the ground awaiting interment, the gravediggers deserted their post, and refused to return.

The mortality was so great that in some instances only one eighth and in others only one fourth part of the population survived.

In St. Thomas in the East, for example, from one seventh to one eighth part of the entire population was destroyed.

In St. Anne's Bay, in Lucea, and in several other districts one third of the population perished.

In Port Maria, Stennett's Town, and Manning's Town fully two thirds of those who remained in the infected districts perished. On some of the estates near Montego Bay upwards of three fourths of the people died.

In one instance (Orange Cove Estate, Lucea,) seventy-five out of ninety persons were swept off, including the overseer, bookkeeper, and fourteen coolies.

In one house in Kingston out of thirty-nine inmates twenty perished in two days. In the workhouse at Montego Bay only three out of fifty-five paupers survived. In many instances whole families and households were swept off, and sometimes not a single resident in the filthy and confined yards of the negroes was left. Kingston may be taken as an example of the mortality of an entire town, in which nearly 5,000 persons perished out of a population of rather less than 40,000. Had London been visited with equal severity, between 200,000 and 300,000 deaths must have taken place.

The total deaths from this epidemic throughout the island numbered at least between 40,000 and 50,000, out of a population computed at about 400,000. The country was therefore more than decimated of its inhabitants; "and if we " suppose," says Dr. Milroy, " that every second person attacked died it will " thus be seen that a full fifth of them were struck with the severe form of the " disease, independently of the prodigious amount of diarrhœa, &c. among the " remaining four fifths. Little wonder, then, that the industrial labour of the " colony has been prostrated; that the price of labour has risen immensely; that " the remuneration of production has correspondently fallen; that very many " estates have been abandoned in consequence; and that a deep and general " gloom hangs over the prospects of the land."

Among the local causes which contributed to this extraordinary mortality Dr. Milroy considers the most important to be, the swampy and malarious ground which has been so often chosen for the site of villages, while comparatively healthy spots are near at hand; the wet and undrained condition of the huts, their want of ventilation, their overcrowding, the accumulation of filth in and around them; the total want of sewerage and drainage, or even of any systematic scavenging in the towns; the frequent want of water; the universal want of a safe and proper place of deposit for the town refuse, the consequent vast collections of manure and other filth in the yards of the houses and in the neighbourhood of the streets, and the state of the burial grounds. These evils are much aggravated by the unwholesome nature of the food of the people, and their general destitution in many parts of the island.

The Board concur in the opinion, that whatever may be the difficulty of remedying some of these evils, others obviously admit of removal or of material mitigation. There are, moreover, several special circumstances to which painful prominence has been given by the deplorable events of the recent visitation, to which the Board would earnestly call the attention of Her Majesty's Secretary for the Colonies as well as of the local legislature.

1. The first point which urgently demands consideration is the means of providing medical relief for the island, and especially for its agricultural districts. It is clear that during the recent visitation great numbers of the people perished without having received any medical assistance whatever. The statement is of constant recurrence throughout this report, that where the disease was of the most malignant type, and deaths were occurring daily in almost every house, no medical man was near or obtainable. In one case, for example, in a district which contains from 20,000 to 25,000 souls, scattered over a range of country of above a thousand square miles, there is not a single medical man nor a dispensary, nor any other means of procuring medicine. In this particular instance two thirds at least of those who were attacked died.

The Board are satisfied, however, that the medical service provided to remedy this dreadful state of things should be of a preventive nature, and analogous to that set forth in the Board's regulations with respect to the nature and duties of the officers of health (a copy of which is annexed). If, under medical superintendence, measures are not taken to prevent the outbreak of the disease, or, where that may not be practicable, to bring it under treatment on its very first attack, the results would be no better than those obtained at Warsaw, where, though an enormous expense was incurred to provide the means of medical assistance, yet that assistance not being carried to the people, but the people being left to apply for it as they themselves thought they needed it, it was found that they never did apply for it until it was too late,—that is, not until the disease was so far advanced that no remedies were of any avail. This disease can be effectually dealt with only by catching it in its premonitory stage, and that stage must be sought for in the localities and houses in which it is prevailing or threatening.

In like manner the only way to check the dreadful waste of life which has been constantly going on in this colony for many years past from the periodic returns of epidemic small-pox is to apply to the whole of the population the preventive means of vaccination, and to apply this remedy with all the care which experience has shown to be absolutely necessary to render it a security.

In the meantime the Board would call attention to the fact, that the deficiency of medical service in this colony has been progressively increasing for several years past, and is still increasing. Thus it is stated that in the parish of St. Andrew's, with an area of 240 square miles, and a population of 20,000 souls, there were formerly seven resident practitioners, all respectively employed in their profession, but that now there is only one.

Of four practitioners in Dorothy, three have left the island, not being able to procure a living, and the fourth died penniless, if not in debt. It seems to be admitted on all hands that this destitution of medical relief is one of the most serious social evils in the present condition of the colony, and that there is not the slighest prospect of the defect being supplied unless by legislative interference. It becomes therefore a question of the greatest importance to determine how this may be done with the largest amount of benefit to the population, and the least risk of miscarriage. After adverting to the failure of the Dispensary Act, a measure adopted by the local legislature in 1846 to meet the difficulty, Dr. Milroy states that no subject occupied his thoughts more during the whole of his residence in the island or since he left it.

" From inquiries," he says, " made in every parish amongst the most intel-" ligent residents, including the planters, medical men, ministers of religion, " and merchants, the following two propositions are in my opinion clearly " deducible; viz., first, that the negro population, with their present feelings " of frequent indifference with regard to their own lives, and their too general " utter unconcern of the lives of their families and friends, will not apply for " medical assistance if they have to pay for it at the time; and, secondly, that " they are quite able to pay for it if they chose to work and earn the wages " which are at all times at their acceptance.

" It was from a consideration of the above two positions that I was induced " to recommend (in my letter to the Governor, vide Appendix A.) the " adoption of a special and direct tax upon all the classes of the community, " from the highest to the lowest, for the purpose of carrying out an effective " scheme for providing of medical relief for the labouring population. If it " be desirable that the people, I remarked, should feel that they have a claim " for medical relief for themselves and families in time of sickness,—that it is " not a boon of charity doled out to them, but a right to which they are " entitled,—then the course appears to me clear,—the right which is claimed " implies the performance of a duty which has been discharged. The habitual " exercise of such a feeling will moreover not be without some effect in " gradually accustoming the mind of the negro to take juster views of the " reciprocal obligations and privileges of civilized life.

" All my subsequent inquiries and observations have but tended to strengthen " the opinion then expressed."

Dr. Milroy cites (page 96) the opinions of various authorities resident in different parts of the island, acquainted with the habits and wants of the people, in confirmation of his view.

The specialities required in preventive medical service to render it effectual for the accomplishment of its object has been felt to have been so great that even in England it has been found necessary to demand, in those who devote themselves to such service, additional qualifications to those of ordinary medical practitioners. The Board cannot but regret the apparent want of information on this subject on the part of the local legislature, as indicated in their proposal to supply the want of qualified medical practitioners in the island by a set of men who are to receive the whole of their medical instruction at one hospital, and that a hospital in Jamaica.

With a view of increasing the efficiency and lessening the public expense of the medical service provided for the island, Dr. Milroy proposes that such offices as that of the coroner, of the inspector of prisons, of emigration agents, of the registrars of births, deaths, and marriages, and of authorized and responsible vaccinators, should devolve on the same salaried medical officer, and that on this officer should be accumulated all the duties and responsibilities of an active and efficient sanitary superintendence of his district. The necessity of such consolidation is often experienced in the thinly-populated districts of England, and the Board have recommended their adoption to the local boards of small towns under the Public Health Act; but whether they are applicable to the colony of Jamaica the Board can offer no opinion, since they have not the requisite knowledge of the local administrative capacities which may be available there.

2. The Board regard the suggestion of Dr. Milroy with reference to the improvement of the dwellings of the people as well worthy of consideration and local promulgation. He proposes that the enjoyment of the elective franchise should be associated with the occupancy of a better description of dwelling. It appears that at present a considerable proportion of the worst hovels are freehold tenements, and confer the right of voting on the holders. The result is represented as mischievous in a sanitary as well as in other points of view, the people being too often the dupes of electioneering intriguers, while they are left to grovel in the vilest squalor and vice. It is suggested that advantage might be taken of this state of things by requiring that every tenement in right of which the franchise is enjoyed should be of certain dimensions, and be provided with certain accommodations.

It is urged, that such a provision in the electoral law would effect a direct improvement on the dwellings, and would lead indirectly to a proportionate improvement in the sanitary, social, and moral condition of their inhabitants. It appears to the Board to be well deserving the consideration of the local legislature, whether it might not be practicable to make the qualification of the elector the condition that he lives in an habitation in which the observance of the decencies of life are possible, and the arrangements of which are such as of themselves to indicate that the possessor is living in the state of civilization rather than of barbarism.

3. The Board cannot but concur with Dr. Milroy that it is most desirable, if practicable, to make, as a condition of future immigration of labourers, that the location of the labourer shall not be an act of treachery towards him, that he shall not be placed in such conditions as are described in this report, in which the European labourer at least is subjected to the hazard of a greater mortality than occurs in war and in actual battle. Some proprietors and managers have prepared proper and healthy dwellings even for their coolie labourers, and it seems but reasonable that this should be required of all. The Board would submit that before fresh labour is introduced, or new expenditure is incurred for this purpose, some provisions should be required for the proper economy of the life and labour which they have. If the labour of the colony were considered merely as stock, an aspect in which it has heretofore been regarded there, the present position of the labourer in the colony is in the unfortunate case which the farmer will understand by the like effects of epidemics on his cattle, when in order to raise one horse two colts must be reared, and the natural period of work of the one reared is by disease and premature death reduced by one third or one half.

There is no exact account of the loss of life in Jamaica, there being no registration of death; but a persuasion appears to be entertained by the medical practitioners there, that the annual mortality among the black population is not less than five per cent. per annum. In a manufacturing district in England, where the population is above 300,000, and where the mortality, though considered extremely high, is under three per cent. per annum, the loss in the value of labour, estimating it at 10*s.* per week for each adult labourer, the period of working ability being in each case reduced one third, or about eleven years, amounted to 600,000*l.* per annum, not taking into this estimate the loss from the excess of infant mortality. This is only mentioned by way of illustration. The Board can have no doubt that if exact statistical returns were obtainable it would be found that the waste of the money value of labour in the West India colonies, from the barbarous habits of the population, and their low sanitary condition, would be enormous.

With reference to one tract of land in Demerara, it was stated the main cause why the labourer was so short lived there, that free labour could not be introduced, was, the labourer had to work amongst stagnant ditches. On inquiry, however, in relation to these ditches, it turned out that they arose from a barbarous mode of drainage, which might be superseded, and that economically, by the method of pipe land drainage in use in England. Irrespective of the question of health, the Board believe that the economy of this method of drainage is fully confirmed by the communications of Dr. Shierar, agricultural chemist to the British colony of Guiana (p. 18.), to whose exposition the Board have referred in their minutes on the drainage of land forming the site of towns (p. 26.) and for which minutes applications have been made, not for sanitary but for agricultural purposes. When apprehensions are entertained of the expense of making the sites of dwellings salubrious, it may be urged that by this method of drainage the site of a town may be drained at an expense varying from 5*s.* to 10*s.* per acre per annum,—a sum which is quite trifling as a charge per house per annum,—and that this operation would be as economical for a crop of life and labour as it is for a crop of vegetable production.

From the nature of the climate, houses may be built in Jamaica of far cheaper materials, and may be made much slighter, than habitations in England. Dr. Milroy refers to the experience of Mr. Stanford, a gentleman of Annotto Bay, who has constructed several wooden buildings of pitch pine at a cost of 26*l.* each, and it is stated that if white pine were used the entire expense would not at the present time exceed 15*l.* Each of these buildings is divided into three compartments or rooms; and though the dimensions of these rooms are represented as too small, yet it is stated that in other respects they are vastly superior to the ordinary hovels of the people, being raised off the ground, floored, and shingled. If so vast an improvement in existing dwellings can be made at so small a cost as this, surely such improved dwellings must be in all respects economical.

With reference to the general expense of sanitary works, the local legislature might be informed of the actual rate at which such works are executed in England, where a constant supply of water brought from a distance of several miles, 50 or 100 gallons a day if needed, are afforded at the cost of one penny farthing per house per week, and taken away again by house drains, including a soil pan apparatus in the nature of a watercloset, for an additional charge of 1*s.* 2*d.* per week, preventing all foul smells. The Board believe that no slave labour that ever existed in the colony could perform the like labour of cleansing and water supply at a price so cheap.*

But these appliances, which are all means to great economies of life and health, are available only by the application of engineering skill; they may not be applicable to such houses as a large proportion of the population of Jamaica is housed in at present; but it is with great satisfaction that the Board have been informed that one of the West India colonies is about to apply for an engineer to lay out public works in the chief towns of the island. If this information should prove to be correct, the Board will rejoice to see such a recognition of the immediate practicability of such works to such a population.

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* If the labour of a slave be worth a shilling a day or a penny an hour, the cost of the removal of fæcal matter once per day by such labour in the manner described at Rio Janeiro would be about six times as great as that of its constant removal under the Public Health Act by combined works of water supply and drainage. "A Rio Janeiro," says a French physician, "l'on se sert de " petits barils que, la nuit venue, des esclaves transportent sur leurs têtes vers la mer pour les y " vider.

" Chaque voyageur, logé même dans le meilleur hôtel, doit s'attacher un esclave pour ce seul " objet, quelquefois des esclaves se laissent corrompre par des voyageurs économes, qui veulent se " servir en fraude d'un baril d'autrui : mais malheur à l'esclave dont la trahison est découverte.

" Apres neuf heures du soir, on voit des milliers d'esclaves, charges de barils, se diriger vers " la mer."

4. Much additional evidence has been afforded by the progress of cholera in this colony of the truth of one point of the greatest practical importance to individuals, families, and bodies of people, for their direction and guidance, should unhappily a similar calamity again befal Jamaica or any other of the West India islands, viz. that security during the prevalence of an epidemic is to be found, not in isolation or prohibition of intercourse with the sick, but in early removal from the infected locality.

Universal experience has shown that in the most extensive outbreaks of epidemics there are spots often near the localities in which the disease is raging with the greatest virulence which may be occupied in perfect safety. By looking out for such places, and removing to them the inhabitants of the close, filthy, nuisance encompassed, and infected courts and streets, vast numbers of lives might be saved. Thus it is stated that while a third part of the people who remained in the town of St. Ann's Bay perished, those who removed from the town, and betook themselves to pure airy localities in the neighbourhood, escaped, without a single exception, a developed attack of the disease, though many of them were affected with diarrhœa at the time of their removal; and that many went from huts in the gully in which deaths had taken place to the fine elevated grounds of Windsor Castle estate, about a mile and a half to the windward of the bay, and that not one of those persons died.

In the town of Annatto Bay a number of persons were taken from their unwholesome dwellings, in many of which deaths had already taken place, to two large and airy wharfs in the town. Not a single fatal case occurred among them.

At Laconia the manager took the step of dispersing all the people, nearly 200 in number, from their huts, as soon as the first case had occurred among them, with the happy result that scarcely any of them were afterwards attacked.

In Port Maria, where two thirds of those who remained on the spot perished, and where fourteen out of seventeen of the inmates of one house were swept off within fifty hours, seven or eight members of a highly respectable family, in which two deaths had already taken place, were induced to leave their house for one in a higher situation, and less exposed to the poisonous malaria of the valley. No fatal case occurred subsequently. Several poor persons who went up from localities where the disease was raging to the fort, and remained there, also escaped. Comparatively few of the 200 who fled from the town upon the outburst of the disease on the 1st of December were fatally attacked. Perhaps the most striking instance was afforded at Trinity Hall estate. A good many deaths had already occurred among people at the works, which are situated in a hollow of the valley, upon the banks of one of the streams. Mr. Shaw, the highly intelligent manager, immediately had all the survivors, almost all of whom were more or less severely suffering at the time, removed to a large building behind the overseer's house, which stands upon a dry eminence close by. Only one case terminated fatally, and all the rest rapidly recovered.

The health of the 3d West India Regiment at Up-Park Camp continued to be tolerably good until the 5th of June. During May indeed there had been many cases of diarrhœa, but they readily yielded to treatment. On the 5th of June two men were attacked with malignant cholera, and both died. Other cases rapidly followed, and continued to occur until the 21st of the month, when the barracks were whitewashed and fumigated. Dr. Summers, the surgeon of the regiment, recommended that the troops should be moved from the barracks, and put under canvas; but his advice was not then followed. There was a lull for a week, and then again the disease broke out on the 28th, with alarming severity. The men were now immediately camped out in tents on the parade ground to the south of the barracks, and with the happy result of at once arresting the pestilence. "No sooner," says Deputy Inspector Dr. Maclean, "were the troops removed from the barrack, where the scourge "was prevailing with excessive malignity, and placed under canvas, than the "disease immediately disappeared from the cantonment." Not a single case was admitted from the encampment, with the exception of one in a man who had been released only the day before from the Penitentiary, where there was a good deal of choleraic disease at the time.

5. The results of this judicious procedure contrast strongly with the consequences of the attempt to bar out the disease by cordons. This expedient was tried in several instances, always with the most signal failure, and sometimes with the effect of adding the calamity of famine to that of pestilence. The results of the experiment in Westmoreland, the details of which are given at pages 27, 28, 31, and seq., afford a warning against all future attempts of this kind. Quarantine, indeed, has had a full trial on this melancholy occasion, and the lessons of experience will have been given in vain if the results are allowed to be forgotten or lost. The absurdity was carried to such an extent that quarantine was actually imposed upon the vessels arriving from Kingston at the outports, after the disease had broken out in different parts of the island, and while inland inter-communication was interrupted.

The disastrous consequences of this measure were manifested, in the authority thus given to the false and ignorant notions which had been propagated of the highly contagious nature of the disease, in the universal panic that followed, and in the absolute diversion of attention from the only trustworthy means of protection.

In a despatch, the 27th of November, from Earl Grey to the Governor, his Lordship expressed his regret at the steps that had been taken, remarking that attempts to arrest the speed of cholera by the prohibition of intercourse with infected places have always proved futile, and are always likely to be so, while, at the same time, by checking trade and industry, they necessarily created great distress among a population exposed to such restrictions, thus aggravating the effect of some of the most powerful predisposing causes of this fatal disease.

Among the most powerful of such predisposing causes is the terror excited by the belief in contagion which the measures here reprobated tended to render universal and intense; and the effect on the negro mind particularly, but by no means on the negro population exclusively, the following descriptions sufficiently show: "The utmost difficulty," says Dr. Milroy, "was experienced "in inducing the blacks to attend upon their relatives, or to administer the "remedies which were ordered. 'No use; he die,' was the common excuse "for neglecting and even abandoning the unfortunate sufferers."

The dread of contagion, says Dr. Bowerbank, much increased the horrors of the epidemic, and added not a few to the number of its victims. In many cases it was impossible to persuade persons to administer to the wants of the sick; they were completely panic stricken. The chief dread appears to be contamination after death. In many instances they laid out the body during life, closing the eyelids with pebbles, and tying up the jaw with a handkerchief.

No small proportion of the attacked rapidly passed into collapse from being cruelly neglected by their own families. Instead of administering the medicines as were provided, or using any means to restore the sick, they proceeded at once to dig a grave for the reception of the unhappy victim as soon as death seemed to take place. There is too much reason to believe that in more instances than one life was not extinct when the body was dragged from where it lay to the hole which had been prepared within a yard or two's distance from the door of the hut.

"The moment they were seized," writes the Rev. Mr. Steward, Incumbent of Rio Bueno, "if the relatives do not abandon the patient, they lay him on "the floor, strip off any good clothes, and think the probable loss of the bed "by such persons dying on it of much more consequence than the loss of "his life."

In several instances the unfortunate victim was at once abandoned by his family, without so much as water near him to slake his thirst. No sooner did life appear to be extinct than the body was put into graves already prepared. It was no common thing for a person apparently in health one hour to be under the ground within three or four hours afterwards. Dr. Berry King, who attended the district, informed me that he felt convinced that several were interred before actual death. He knew of two cases where the persons recovered when preparations were making for their burial. So great was the dread of touching a dead body,—the idea had been circulated that the contagion of cholera is much more active after death than during life,—that on more than one occasion a rope was actually put round the neck of the patient while yet alive, in order that the corpse might be dragged to the hole close by without the risk of contact.

From a review of the whole of the circumstances attending the prohibition of intercourse during this epidemic, Dr. Milroy arrives at the conclusion that it is high time that the whole system of quarantine should be reviewed, and that the changes which science and experience alike suggest should be made.

The practical changes in Jamaica with reference to the system which Dr. Milroy thinks might at once be carried into effect by the Governor and local legislature are detailed at p. 88.

As the local Act under which the quarantine powers are exercised (4 Vict. c. 32.) vests these powers entirely in the Governor and Council, there appears to be no reason why these functionaries might not set about the more urgent of these reforms at once. On one point Dr. Milroy expresses a very earnest opinion; namely, that whatever portion of this system may be retained the practice should be uniformly the same in all the West India colonies, and that its administration should be placed under medical and strictly responsible authority.

The Central Board of Health of Jamaica, whose elaborate and able report is highly worthy of attention, entirely concur in the opinions and recommendations of Dr. Milroy.

6. Dr. Milroy concludes his report by expressing the conviction of the necessity of an active supervision on the part of the Colonial Office of the sanitary condition of the West India colonies; otherwise he is persuaded that no substantial and permanent improvement will be effected. "I would beg," he says, "to repeat my very strong conviction that no effective amelioration " in the sanitary condition of Jamaica will take place unless a deep and " active interest in the matter be manifested by Her Majesty's Government. " The colonists, if left to themselves, will do little, and that little badly. On " the other hand, no stimulus will act more favourably on their exertions " than that of feeling that these exertions are overlooked and directed from the " mother country. If such were the case many errors would be rectified, " abuses corrected, and works of social improvement carried out. The remark " applies of course specially to matters connected with public health; for it is " upon these that all governmental supervision has as yet been so thoroughly " wanting. In legal and ecclesiastical matters not only does the colonial " minister exercise considerable patronage and control, but an appeal on " various occasions lies to the courts at home; but there is nothing of the sort " on points the right adjustment of which is quite as intimately associated " with the moral improvement as well as the social welfare of a community, " and more particularly when that community is in a low state of civilization, " as in our West India possessions. If there be such a waste of human life " continually going on as has been represented in the preceding pages, not " to mention the preventible sacrifice of tens of thousands during the late " pestilence, does it not become a question of state policy to consider what " means should be taken to arrest the evil? This has been done to a very " great extent in the case of our troops serving there, and with what gratifying " results I need not say. Why should not a like care be exercised in the case " of the civil population? One cause doubtless of the latter having been " entirely neglected is, that while in the case of the military and naval " services there have always been at home special boards of superintendence " and direction to whom periodic reports of the health of our soldiers and " sailors have been regularly sent from every station in the world, and who " are thus enabled to devise and carry out suggested measures of improvement, " there has been no machinery whatever for even so much as ascertaining the " condition of the mass of the people in our colonial possessions.

" It appears to me that many import advantages would result if each colony " was required to transmit to the Colonial Office reports on the state of the " public health and on the sanitary conditions of the people at regular inter- " vals of time. By this simple expedient an immense amount of most instructive " information would be obtained which could not fail to be of inestimable " value both to the mother country and to her numerous dependencies."

In conclusion, the Board are of opinion that the facts and suggestions contained in this report are calculated to make a deep, lasting, and very beneficial impression on all who are interested in the welfare of Jamaica.

I have, &c.
C. MACAULAY,
Secretary.

F. Peel, Esq., M.P.
&c. &c.

DUTIES OF THE OFFICER OF HEALTH.*

THE officer of health stands on a different footing in relation to the local board from either the surveyor or inspector of nuisances. The duties of the latter officers are defined by the Act and governed by the byelaws of the local board; but by the 40th section of the Act the General Board of Health is empowered to direct the duties which the officer of health is to perform. His office does not come within the 37th section, but is governed entirely by the 40th.

The special duties of this officer, which have been already adverted to in the letter to the chairman, will be found to require special qualifications. In populous districts his duties, if properly discharged, can hardly fail to occupy the whole of his time, to the exclusion of private practice.

In the case of Liverpool, the exclusive services of an eminent medical practitioner have been secured in this capacity, and before the first appointment was made it was required by the Home Secretary that this officer should devote his whole time to the public service. The advantages that have followed this regulation in Liverpool prove that it would be a great gain to the community if the practice were general, and if every large and populous district under the Public Health Act had its special officer of health entirely excluded from private practice, while smaller and less densely-peopled districts united together to obtain the services of such a functionary. The Act has charged the General Board (which has a veto both on his appointment and removal) with the task of prescribing his duties and determining his fitness. One duty, however, expressly imposed by the Act on the officer of health, is (under section 60.) that of certifying that any house or any part thereof is in such a filthy or unwholesome condition that the health of any person is affected or endangered thereby, or that the whitewashing, cleansing, or purifying of any house or part thereof would tend to prevent or check any infectious or contagious disease. Local boards are empowered, by various sections of the Act specially enumerated among the powers of the local board, to make byelaws for slaughter-houses, lodging houses, houses for the reception of the dead, and for the regulation of newly established, noxious, or offensive businesses.

The duties which should be imposed upon the officer of health under each of these heads will be found in the draft byelaws drawn up by the General Board, together with a separate minute on the duties of medical officers.

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* From the minutes of instructions of the General Board of Health for the use of local boards of health with reference to the powers and duties of such boards and of their officers.

EPIDEMIC (BERMUDA).

RETURN to an Address of the Honourable The House of Commons,
dated 20 December 1854;—*for*,

A "COPY of a DESPATCH from the Governor of *Bermuda*, enclosing a REPORT from the Commissioners appointed to inquire into the Origin of the EPIDEMIC which lately prevailed at *Bermuda*."

Colonial Office,
22 December 1854.

FREDERICK PEEL.

(No. 77.)

COPY of a DESPATCH from the Officer Administering the Government to the Duke of *Newcastle*.

Officer Administering the Government to the Duke of Newcastle.
8 July 1854.

Bermuda, 8 July 1854.
(Received, 14 August 1854.)

My Lord Duke,

I HAVE the honour to transmit by this mail the Report of the Commissioners of Inquiry into the causes and origin of the yellow fever which afflicted this colony last year, ordered by Governor Elliot, in pursuance of your Grace's despatch, No. 54, of the 24th October 1853.

2. The report is accompanied by a voluminous appendix containing valuable information, the circulation of which would prove extremely beneficial to Her Majesty's subjects in this colony and in tropical countries generally. Should it appear in this light to your Grace, I would respectfully express a hope that the Imperial Government may cause it to be printed and distributed.

3. But few can, I fear, fail in arriving at the conviction that the fever was engendered at Bermuda. That it was not imported by any of the vessels to which the Commissioners' inquiries were directed is, I think, clearly established. It broke out in so many distant places simultaneously that their investigations have failed in determining its distinct origin; but it appears to have been early foreshadowed by various premonitory symptoms among the convict establishment at the western end of the colony, a decided case having occurred on board the "Tenedos" convict hospital hulk, off Boaz Island, as early as the 5th July. Several other cases took place before the period (16th August) on which the "Thames" convict hulk at St. George's was moved at her moorings, for some days after which it will be seen that the mortality at that place was on the decrease. That hulk was found to have been in a proper condition of cleanliness and ventilation; neither were the discipline or occupations of the convicts on board of her, or at any of the establishments, such as to predispose them to fever more in this than any other year. Masses of human beings, especially of Europeans, must always be the principal attraction and focus of yellow fever, and accordingly it fell with extreme virulence on the convicts and troops, amongst whom separation to a sufficient extent is impracticable.

4. As regards the communicability of yellow fever, 38 evidences in favour of that view are opposed to four against it; but notwithstanding such preponderance, the impression irresistibly remains, that the arguments of the advocates of contagion are not thoroughly conclusive; and that with one exception only, that of the Cooper family, which is at least curious, all the cited cases might have occurred without being ascribed to communicability.

5. That infection was communicated to the troops by the smoke arising from the burning of infected bedding on the beach is disbelieved by the Commissioners; and this conclusion is strengthened by the writings published in the Edinburgh Review by the late eminent Dr. Fergusson, Inspector-general of Military Hospitals. He states that it is proved by direct experiment, that even the concentrated matter of small-pox, cow-pox, and the fomites of scarlatina, are

deprived of all inoculating or infecting power on being subjected to a heat of 140° of Fahrenheit's thermometer.

6. However unwelcome the conclusion that yellow fever is (under certain circumstances of atmosphere and temperature, not yet understood) engendered on the spot, and that despite all that the science and intelligence of man can dictate, such visitations will recur, yet their past infrequency, with the little that has yet been done to avert them, justifies the hope that the predisposition to them is but feeble, and that a slight attention to the generally recognised sanitary requirements of cleanliness, ventilation, sewerage, and dry lodging, would retard their spread, and so far mitigate their intensity as to render them far less formidable than they have been.

7. Unfortunately the bad description of native building materials, the fatal scarcity of water, and the high rate of labour, offer serious obstacles to a sufficiently general adoption of these great discouragements to fever; they are within the means comparatively of but few, and in some instances scarcely attainable under any circumstances; they are with little exception, costly in this country; and these considerations have, I am persuaded, chiefly led to their not being sufficiently regarded; but it is high time they should be acknowledged and insisted upon to the extent that may be practicable; that the means should not be withheld from public departments; and that compulsory enactments should be established both on bodies and individuals. We might thus reasonably indulge more than an expectation that this generally healthy colony would not again experience the infliction of such wide spread desolation as befell it in 1853.

Not Printed.

8. A plan of the town and environs of Saint George's, on a scale of 100 feet to an inch, surveyed and drawn by the surveyor-general of the colony, by order of Governor Elliot, accompanies the report. The hills and high ground are not sufficiently expressed to convey a correct idea of the deep hollow in which the town lies.

I have, &c.
(signed) *Montgomery Williams*,
Lieutenant-colonel Royal Engineers,
administering the Government.

Enclosure No. 1.

Enclosure No. 1.

Sir
Hamilton, Bermuda, 29 April 1854.

I HAVE the honour herewith to transmit to you the Report of the Commissioners directed to inquire into the origin and circumstances of the yellow fever which prevailed in Bermuda last year.

To avoid further delay, I have sent in the Report without the appendix, which is in course of being copied, and as soon as this is done it shall be forwarded to you for the purpose of having the originals preserved at Government House, and a copy sent home to England.

I have, &c.
(signed) *S. Oakeley*,
Lieut.-colonel, 56th Regiment,
Chairman.

His Honour the Acting-Governor,
&c. &c. &c.

Enclosure No. 2.

Enclosure No. 2.

Sir,
Hamilton, Bermuda, 15 June 1854.

I HAVE the honour to forward to you copy of answers to the printed questions, and other information on the late epidemic fever, the report on which I had the honour to send you some time back. I likewise send the original documents for the purpose of their being preserved at Government House, so that at any future period reference can easily be made to them, should it be requisite.

On the other side I enclose an account of the expenses of the Commission. You will perceive that this does not include any remuneration to the attorney or solicitor-general, nor the amount to be paid to the surveyor-general for his plan of St. George's, as up to this time no plan has been received.

I have, &c.
(signed) *S. Oakeley*,
Lieut.-colonel, 56th Regiment,
Chairman.

His Honour the Acting-Governor,
&c. &c. &c.

ACCOUNT of Disbursements on the Commission of Inquiry directed by Her Majesty's Government into the Origin and Causes of the Epidemic Yellow Fever in *Bermuda* in 1853.

	£.	*s.*	*d.*
Mr. D. M'Phee Lee's account, enclosed - - - - - -	7	6	3
Various sums paid by Chairman of Commission to witnesses for attending Commission, travelling expenses, &c. &c. - -	5	10	2
Paid for copying proceedings of Commission - - - - -	5	–	–
£.	17	16	5

REPORT

Of the COMMISSIONERS on the YELLOW FEVER at *Bermuda* in 1853.

Report on the Yellow Fever of 1853.

To his Honour Lieutenant-Colonel Montgomery Williams, R.E., Acting Governor, &c. &c. &c.

Sir, Hamilton, Bermuda, 29 April 1854.

IN obedience to the instructions conveyed to us in Governor Elliot's letter of the 16th of December, accompanying a commission of the same date, under the great seal of the colony, addressed to Major Byles and ourselves, we have been engaged in the inquiry thereby intrusted to us, which was directed by the Secretary of State's Despatch, No. 54, of the 24th of October last, into the origin and causes of the fatal epidemic fever which prevailed in this colony during the past year, with a view to discover any means by which similar calamities may be prevented or mitigated in future.

2. In the execution of this important duty, we regret that we have been deprived of the valuable co-operation of Major Byles, who was compelled by severe indisposition to leave Bermuda, without having attended any meeting of the Commissioners.

3. In explanation of the apparent delay which has occurred in completing our report, we would respectfully observe, that it having appeared to Governor Elliot and to ourselves, very desirable that printed questions should be circulated among the various public functionaries and private medical practitioners, from whom information was sought, so as to enable them to frame their answers with greater accuracy and deliberation, than could be expected on a summary oral examination, that course was pursued in a majority of cases in addition to the vivâ voce examination of some individuals, when this mode seemed more eligible. But, as many of the returns to be made to us required considerable research, which, from the death of various persons, was attended with difficulty, and as in most instances we had no power of expediting the answers, we have had to await the convenience of the parties, and this circumstance with others consequent upon the late epidemic, has unavoidably retarded our proceedings to a degree much beyond what we had anticipated.

4. With the view of obtaining the fullest information from all quarters, we have requested answers to these questions, not only from the principal military and medical officers of the garrison, the naval yard and the convict establishment, but also from the local Boards of Health, the health officers, the parish vestries, the officers connected with the prisons and police, and private medical practitioners; and where the elucidation of any particular circumstance seemed to require it, we have endeavoured to obtain the evidence of other persons most conversant with the matter. The details of this body of evidence will be found in the appendix accompanying this report.

5. We conceive that the most convenient mode of submitting the results of our investigation, will be to offer a condensed statement of the principal events connected with the epidemic, in the order in which they occurred, with such suggestions as we trust may tend in some degree to prevent the recurrence of the evil.

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6. During the summer of 1853, and before the appearance of the fever at Bermuda, the fall of rain had been unusually great, and the heat, attended with much calm weather, continued to a later period of the year than is ordinarily experienced. It was generally remarked that the vegetation was unusually exuberant, and the crops of oranges and other tropical fruits were abundant beyond precedent. Fever to an extraordinary degree of virulence and mortality had prevailed throughout the West Indies, the Bahamas, and at some of the southern ports of the United States of America. And, without ascribing undue importance to the circumstance, we may mention the fact, remarked at the time, that, as in the fever year of 1843, a comet was visible at Bermuda in the height of the summer.

7. As early as the 6th June, Dr. Hall, medical superintendent of the convict establishment, reported to Lieutenant Colonel Phillpotts, R. E., then acting governor of the colony, as follows: "From the many severe cases of dysentery that have been admitted into this hospital during the last two months, I apprehend that much sickness will prevail among the convicts during this summer." Unhappily this anticipation was but two speedily realized, for on the 9th July, Dr. Hall, in reporting the death of a convict from fever, added that a few cases had recently appeared, and on the 16th, that cases were daily presenting themselves of the common type of fever of the hot season, and that although several cases had been admitted, one only had proved fatal.

8. From this period the fever continued to increase among the convicts in the hulks at Ireland Island and the prisons at Boaz Island; 120 cases were admitted into the "Tenedos" convict hospital ship before the 29th August. In consequence of a recommendation then made by Dr. Hall, one of the convict prisons at Boaz Island was appropriated for the reception of convalescents from the hospital ship, and up to the middle of September the epidemic continued unabated among the officers and prisoners there, but the mortality was comparatively small.

9. Among the troops at Ireland Island cases of yellow fever occurred in the latter part of August. Lieutenant Higgon, of the Artillery, was attacked there on the 27th, and ultimately recovered. A private soldier of the 56th regiment was admitted to the Royal Naval Hospital there on 28th August, with yellow fever, and, after being nine days in hospital, recovered.

So long before that time as the 14th July an artilleryman was sent to the same hospital "with dysenteric symptoms, which merged into those of fever, and he died on 22d July." During the epidemic, "131 cases were received" (into that hospital); "39 of them died. Of the individuals, to the number of 419, belonging to the Naval Yard, 29 were attacked by febrile symptoms, but only seven proved to be cases of the epidemic, and they all recovered. There were five cases of the epidemic among 34 persons, forming the families connected with that hospital, two of which five died."

The Commissioners cannot but attribute the remarkable exemption of the residents at the Naval Yard from the epidemic very much to the prompt sanitary precautions adopted by Mr. Ballingall, the naval storekeeper, Mr. Hilditch, the inspector of the hospital, and Mr. Anderson, the civil engineer of the yard, in conjunction with the ample space allowed to each person in the dwellings.

10. The earliest cases of yellow fever among the native population of the colony that have come to our knowledge occurred on St. David's Island; the earliest death was that of Samuel Fox, of St. David's Island, a boy nine years old, who died there on the 2d August, with black vomit. He was the son of Benjamin Fox, a pilot, who lived across the harbour, just opposite to the town of Saint George. It was alleged by some that the fever had been communicated to Samuel Fox from Israel Burcher's family; but, as will hereafter appear, the evidence of his having taken it in this way is exceedingly doubtful. It has also been surmised that Samuel Fox had taken the infection from a parcel of clothing belonging to an elder brother who had died of yellow fever in the West Indies in the early part of the year, which clothing had been brought here from New York in the beginning of May; but the inquiries which the Commissioners have instituted with respect to the case of Samuel Fox show satisfactorily that the clothing, after being brought on shore from the vessel from New York, was placed in an uninhabited house on St. David's Island. About 10 days afterwards

it was removed to an open place on the sea-shore, at a considerable distance from any inhabited house, there opened, the clothing (which was generally new, clean, and unused) was carefully smoked and washed, then spread out in the open air for two days, and put in a trunk, without having ever been seen or touched by Samuel Fox, nailed up and remained unopened until late in the month of October, nearly three months after the death of Samuel Fox. We think it may safely be inferred that he did not receive any infection from his brother's clothing.

11. Amongst various rumours as to the origin of the fever, one frequently referred to was, that it had been introduced into Bermuda by the steam-packet "Merlin," which vessel arrived here from the Island of St. Thomas on the 25th June. The body of a lady who had died on board was brought on shore, and buried at St. George's on that day. The face of the corpse, when seen on board, exhibited some yellowness. The officiating health officer, Dr. Frederick Hunter, inspected the body, and from that inspection and the representations made to him by persons on board (including a military staff surgeon, who happened to be a passenger), he was of opinion that she had died from the debilitating effects of intermittent fever, arising most probably from a diseased state of the liver. It has been reported that a bundle of clothing was picked up at the sea-shore about this time by Mrs. Davis, the wife of a soldier stationed at Paget Island, near the entrance of St. George's Harbour, and used by her, and that this clothing had belonged to the deceased lady passenger in the "Merlin." Mrs. Davis was attacked by yellow fever on the 13th August, and died on the 20th. Subsequently to her death this report came into circulation; but after the fullest inquiry which the Commissioners have been able to make, they have satisfied themselves that no such clothing ever came into the possession of Mrs. Davis, and that her death was in nowise connected with the "Merlin."

12. Another report with relation to the "Merlin" was, that the family of the pilot of that ship, shortly after her departure from Bermuda, were attacked with yellow fever, and these are supposed to have been among the earliest cases which occurred. The Commissioners have been particularly careful in investigating this point, and in examining Israel Burcher, the pilot, very minutely. His family consisted of himself, his wife, and a young woman living with them. He declares that he himself had no sickness at all; that about a week after the departure of the "Merlin" his wife, and some days afterwards the young woman, were taken with headache and pain in their limbs, used sage tea and warm baths, and got well in three or four days, without calling in a doctor, and he does not believe that they had the yellow fever. In the absence, therefore, of any clear evidence connecting the origin of the fever with the arrival of the "Merlin," the Commissioners cannot ascribe it to that cause.

13. On the 20th August a heavy gale of wind caused the "Thames" hulk, lying at St. George's, to part one of her moorings, and by the change of her position in the bank of mud and filth in which her keel was embedded, raised a stench exceedingly noisome not only to the persons on board but to the occupants of the Royal Barracks, towards which it was blown by the prevailing winds.

14. On Sunday, 21st August, the Spanish war steamer, "Blasco de Garay," arrived at Murray's Anchorage in six days from the Havana, where, as in other parts of the West Indies, the yellow fever had prevailed during the summer of 1853 with great malignity. This ship proceeded from Murray's Anchorage to the Naval Yard at Ireland Island, but being unable to procure a supply of coals there, came into St. George's Harbour on the 22d August for that purpose, where she remained until 30th August, when she left Bermuda for Cadiz. On her arrival here she was boarded by the officiating health officer; the captain and surgeon were interrogated by him, on oath (through the medium of the principal engineer, an Englishman, who acted as interpreter), and in reply to the interrogatories put to them, they both stated that there had not been any death or sickness on board during the voyage, with the exception of a few cases of venereal disease. No death occurred on board of this ship at Bermuda. During her stay here there was a considerable interchange of civility between her officers and the officers of the garrison, dining with each other on board and on shore. Besides these visits, two medical officers of the garrison, on different days,

Report on the Yellow Fever of 1853.

days, went through the ship, and were accompanied by her surgeon to the sick bay, at which time there were no fever patients on board, thus confirming the result of the previous inquiries made by the health officer. The first officer of the garrison at St. George's who took the fever was Assistant-surgeon Deeble, of the 56th Regiment, who was one of those who had been in the sick bay of the "Blasco de Garay;" he was attacked on the 4th September, and after a severe illness recovered on the 8th September. Lieutenant Woodford, of the same regiment, who had also been on board that ship, was attacked with fever, and died on the 12th. On the 17th September Captain Hare died, whose wife had died on the 15th; and on the 20th September Assistant-surgeon Lawson, 56th Regiment; on the 21st, Lieutenant-colonel Robe, R. A.; on the 25th, Lieutenant Greatorex, R. E.; on the 26th, Lieutenant Sykes, 56th Regiment, died. These officers, it is believed, had visited the "Blasco de Garay," but many other officers who had visited that ship did not take the fever.

15. However, before the arrival of the "Blasco de Garay" at Bermuda, Robert Hall, a prisoner in the "Thames," at St. George's, had been taken ill with cholera on the 10th August, and died on the 17th with fever. As usual with prisoners dying in the hulks, a coroner's inquest was held. From the appearance of the body, the coroner was of opinion (as stated in his answers to us) that the man died of yellow fever. The surgeon of the hulk, in his evidence before the coroner, stated "that, in consequence of some obscurity in the symptoms, he had for his own satisfaction had a post mortem examination that morning, when the body exhibited the usual appearance of fever;" and further stated, that he "considered the immediate cause of his death to have been gastric fever." From the appearance of the body after death, Captain Jervis, R. N., deputy superintendent of convicts, "considered it was a case of yellow fever, although denied as such by the medical officer."

On the 18th August another convict was attacked on board that hulk, and died on the 26th; on that day another convict died; on the day before, one guard and one convict had died, and on the day after the number of sick on board had increased to eight officers and 45 convicts. This appears to have excited some anxiety in the town, and before the departure of the "Blasco de Garay" the fever had increased to an alarming extent in the "Thames." On the 22d August, the day on which the Spanish steamer arrived at St. George's, there were 34 sick in the "Thames." On the 29th, when Mr. Howes became the acting overseer of that hulk, he states, "there were 60 cases of fever on board," and "the ship was full of disease." Some cases had also appeared among the military at St. George's, in addition to that of Mrs. Davis, already mentioned. In the first week of September several deaths occurred among the inhabitants of the town of St. George, residing in the immediate vicinity of the "Thames," in the low ground at the foot of the Barrack Hill. Some of the persons who died in this neighbourhood had attended inquests on board the "Thames." From this quarter the disease appeared to creep up the hill, step by step, until it reached Colonel Phillpott's house, on the summit, who died there on the 18th September.

16. There is no reason for believing that there had been any intercourse between the prisoners in the "Thames" and the Spanish steamer, nor should we omit to mention that Surgeon Jones, and Assistant-surgeon Deeble of the 56th Regiment, both agree in not attributing the spread of the epidemic to the "Blasco de Garay."

17. A paragraph has appeared in a London newspaper (the "Spectator" of 22d October 1853), stating that a Spanish mail steamer called the "Velasco," on 17th September (when she rescued some shipwrecked mariners from a raft), had yellow fever on board, and was subsequently placed in quarantine at Vigo; but that the shipwrecked persons did not appear to have suffered from fever. Supposing this to have been the same ship which left Bermuda for Cadiz, on the 30th August, it might be an interesting subject of inquiry to ascertain, whether the yellow fever among her crew was supposed to have been contracted before her arrival at Bermuda, or during her stay here, and the date of the first case which occurred after her departure from Bermuda.

18. It is certainly much to be lamented that at this time a letter appeared in the Bermuda "Gazette," from Dr. Joseph Stuart Hunter, surgeon of the "Thames,"

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"Thames," to the editor, dated 29th August, in which he observes: "Reports but too well calculated to create alarm in the present state of public feeling, and recall to memory painful reminiscences of the year 1843, have been industriously circulated in our little community; may I beg the favour of your conveying through your widely circulated journal the assurance that the epidemic at present prevailing among the prisoners of the "Thames" is not the yellow fever; and further, that the disease is neither contagious or infectious."

A week afterwards there appeared in the same paper a letter from Surgeon Innes, dated 5th September (a copy of which is in the Appendix), written with the view of quieting the public mind, and characterizing the disease as a milder form of yellow fever.

The Commissioners are far from imputing any improper motive to these gentlemen. On the contrary, we feel assured that (not then suspecting the malignity of the disease) their object was to prevent any panic in the community, and to avert the ill consequences which are so apt to result from unnecessary alarm on such occasions; and we cheerfully bear testimony to their indefatigable exertions when the danger became more apparent. But it is much to be apprehended that the publication of these letters, at that period, had a tendency to create an erroneous impression respecting the fever, and, by that means, to occasion a disregard of precautions which might otherwise have been used with the most salutary effect.

The same desire to avoid the mischief of creating a panic, no doubt influenced the acting governor (to whose melancholy death we have already adverted) in abstaining from an earlier removal of the convicts from the "Thames," and of the troops from the barracks, than was actually carried into operation.

19. On the 30th August the healthy prisoners in the "Thames" were separated from the sick and removed on board the dockyard craft "Cassius," which had been sent to St. George's for that purpose. On the 4th September the hulk "Weymouth," having been fitted at the dockyard and towed to St. George's, and moored out in the harbour, all the sick and convalescent prisoners were removed to her from the "Thames," and on the 6th September 210 beds, as many blankets and as many hammocks, besides a quantity of prisoners' clothing, by the order of the surgeon of the "Thames," were burnt on the beach at the foot of the cliff on which stand the Royal Barracks. It has been represented to us that this occasioned a very offensive stench at the barracks, the wind blowing in that direction, and the thermometer (as registered at Mount Langton) being at 85° on that day. The Commissioners note these particulars, as they are required to do by Governor Elliot's letter, but do not affirm that this was the cause of any increase of fever among the troops. The burning of the bedding would, under any circumstances, be disagreeable, whether conveying infection or not. We observe that the number of patients admitted to the military hospital during that week, was as follows: On 5th September, 9; on the 6th, 8; on the 7th, 7; on the 8th, 5; on the 9th, 3; on the 10th, 7; on the 11th, 5; on the 12th, 10; and on the 13th, when the force was marched to "Ferry Point," and there encamped, 32 were admitted into hospital. This sudden increase of the number of sick may probably be attributed to the fatigue of the march.

20. On the 2d September all the families of the soldiers of the 56th Regiment were removed to an open field between the barracks and the hospital, with a northern aspect towards the sea.

On the 5th September the convalescents were removed from the military hospital to "Ferry Point." In addition to the Royal Military Hospital, the Garrison Chapel, near the Royal Barracks, had been previously converted into a temporary hospital. After several days' disappointment from the want of sufficient means of transport, and the inclemency of the weather, the greater part of the sick of the 56th Regiment at St. George's were transported to Port's Island on the 25th September. On the 29th September, 35 were conveyed from St. George's to the Naval Hospital at Ireland Island, and soon afterwards the Ordnance Hospital at St. George's was evacuated, the patients being conveyed to Prospect Hill. On the 30th September, the company of the 56th Regiment stationed at Hamilton marched to a range of buildings called "Oxford," on an airy point of land about two miles out of town. This removal of the troops from the Barracks appears to have been attended with the most beneficial effects.

21. With reference to the case of the brigantine "Charles," especially adverted to in Governor Elliot's letter to us, it appears that that vessel arrived, with the quarantine flag hoisted, at the Quarantine Ground in the Sound leading to Hamilton, on the 10th October, in 15 days from Demerara for Newfoundland. She was boarded by Dr. Harvey, the Hamilton health officer, who informs us that he interrogated the captain (Taylor), but not on oath; that the dead body of the captain's wife was on board, and was inspected by the health officer, when it exhibited no indication of death having been occasioned by malignant disease. That the captain stated that she had died the night before, after a long illness, and after having gone out to the West Indies from Newfoundland for the benefit of her health, and that he had come into port with the view of having the body buried in consecrated ground. That the health officer suggested her being buried on one of the neighbouring uninhabited islands, which the captain declined. The health officer further states that upon a careful examination of the officers and crew they were apparently in good health, and the captain denied that any one had been ill on board except his wife. The next day the use of a vault in Paget's Churchyard having been offered to the captain, the body was brought on shore in a boat, accompanied by the health officer, and was buried in Paget's Churchyard. The captain then went to a lodging-house in Hamilton, and lived there until the 16th October, when he sailed in his vessel from the Quarantine Ground for Newfoundland. During her stay here, on the fourth day after her arrival, the second mate was taken very ill, and died about two days afterwards, with evident symptoms of yellow fever. He had been visited by the health officer, and was buried on an uninhabited island. Immediately after this man's burial, some of the crew mentioned that they had lost a man by fever while coming from Demerara, and that the crew they had on board, with the exception of two or three, was a fresh crew, as they had lost their former crew by fever at Demerara. On the 27th October a lad died of yellow fever at the lodging-house where Captain Taylor had lived, and on the 28th and 31st two children also died there, and one on the 4th November; but it is fair to observe that a number of deaths from fever had occurred in that neighbourhood before Captain Taylor went there.

The Commissioners cannot but regret that the health officer allowed himself to be imposed upon by the gross misrepresentations made by Captain Taylor as to the previous health of his crew, as a dead body was then actually on board, and the vessel had come from a place where yellow fever is often prevalent; we think he should have exercised the discretion given to him by the quarantine law, of interrogating, upon oath, the captain and others, with such strictness as would in all probability have elicited the truth, and by that means have prevented the burial in Paget's Churchyard, and Captain Taylor being permitted to come to Hamilton. The Commissioners do not, however, attribute the introduction of the fever to this vessel, for, before her arrival, it had prevailed extensively at St. George's, at Ireland Island, and at Hamilton.

22. During the intensity of the epidemic such was the pressure upon the medical officers of the different departments, that it became necessary to call in additional aid. Four of the civil practitioners of the colony were from time to time engaged in the public service, and several assistant surgeons were added to the military and naval staff at Bermuda during the emergency.

The colonial legislature being in session, sums of money were granted and further powers given to the Boards of Health in the towns, and the vestries of the parishes, enabling them to provide temporary hospitals, nurses, medical assistance, and supplies for the poor, and to carry into effect other sanitary regulations. The Boards of Health accordingly adopted various measures for that purpose. A temporary fever hospital was provided in Pembroke Parish; and a new site for a cemetery in St. George's (instead of the over-crowded churchyard in that town) was selected by the parishioners, and has since been granted for that object by the Crown.

23. With reference to the movements of the troops stationed at Ireland Island, we find that "the naval storekeeper having given up a portion of a large new building in the dockyard for their temporary accommodation, it was prepared for their reception," and "on the 27th September, 80 non-commissioned officers and

men

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men were moved into it from the Casemate Barrack. A careful observation of the men, removing them to hospital on the first symptom of an attack, and unremitting attention to ventilation as far as practicable, together with whitewashing of the rooms, and a constant cleansing of the drains, were additional precautions taken to arrest the disease; but the number of cases augmenting, a further separation of the garrison was determined on by Major Oakeley, at that time acting governor. Accordingly, on the 24th October, one officer and 100 non-commissioned officers and men were removed to Tucker's Island, and, on the 28th, another officer and 50 more followed, a portion of them being accommodated in a house, the remainder in tents." Of this force, removed to Tucker's Island, only three were attacked with fever (and those were slight cases of relapse), but the daily proportion "of cases in regard to the numbers of the remaining force" (at Ireland Island), "showed no diminution for nearly a month afterwards, and the disease appeared to gain in intensity and become more virulent." One cause, among others, of the salubrity at Tucker's Island may fairly be deduced from the difficulty of the soldiers obtaining liquor there.

24. On the 31st October the encampment at Ferry Point was broken up, the troops moved from there to Prospect Hill, where another encampment was formed, and a few days afterwards a portion of them to the vacant school building in Devonshire parish (a commodious house on an airy and healthy eminence about the centre of the colony), where they appear to have been entirely exempt from fever.

25. At the Telegraph station at Gibbs' Hill, a non-commissioned officer and three men were posted, who do not appear to have suffered at all from the epidemic; and the party at the Mount Langton Telegraph, consisting of about 12, was equally fortunate, with the exception of the sergeant's wife and one of the men, who had slight attacks.

26. The apprehension of further danger from the fever having subsided, the troops at the outposts, at Oxford and Prospect Hill, re-occupied their former barracks at Hamilton in December, head quarters having been established there. A company marched from the Devonshire schoolhouse to St. George's on 10th January, and near the end of that month that post was finally evacuated by the troops. Those at Tucker's Island returned to Ireland Island on 22d December, since which time the fever has not re-appeared among the troops or the convicts.

27. The epidemic appears to have attained its utmost virulence in the latter part of September and the first weeks of October, although many cases occurred in November, and several down to the very close of the year. And it is remarkable, that although the fever, in the earlier stages of its progress, did not affect the native inhabitants so generally or so fatally as persons from northern climates, yet at a later period, even when on the approach of winter the weather had become cooler, the natives seemed more susceptible of the disease, and the victims among that portion of the community became more numerous.

28. On the 1st July the strength of the garrison was as follows:—

Royal Artillery - -	Officers - - - - - -	5	
	Men - - - - - -	156	161
Royal Engineers - -	Officers - - - - -	5	
	Men - - - - - -	94	99
56th Regiment - -	Officers - - - - -	18	
	Men - - - - - -	1,016	1,034
Of the 56th Regiment:	Women - - - - -	66	
	Children - - - - -	157	223
			1,517

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The strength of the convict establishment on 1st July was as follows: Ireland Island and Boaz Island, hulks, prisons, and hospital ship:—

Officers - - - - - - - - -	95	
Convicts - - - - - - - - -	1,446	
		1,541
St. George's "Thames" hulk:—		
Officers - - - - - - - - -	21	
Convicts - - - - - - - - -	216	
		237
		1,778

The population of Bermuda (exclusively of the military, naval, and convict establishments), according to the official census of 1st January 1851, was:—

St. George's parish - - - - - - - -	1,891
Hamilton parish - - - - - - - -	1,094
Smith's - - - - - - - - -	514
Devonshire - - - - - - - - -	784
Pembroke, including the town of Hamilton - - -	2,235
Paget - - - - - - - - - -	1,038
Warwick - - - - - - - - -	983
Southampton - - - - - - - - -	917
Sandy's - - - - - - - - -	1,636
	11,092

* The total number of deaths from the fever, from 1st July to 31st December (as nearly as the Commissioners have been able to ascertain the same), was as follows:—

Of the Garrison:			
Royal Artillerymen - - - - - - -		48	
Royal Sappers and Miners (men) - - - - -		25	
56th Regiment (men) - - - - - - -		222	
Commissariat department (men) - - - - -		2	
Women - - - - - - - - - -		29	
Children - - - - - - - - -		19	345
Officers:			
Royal Artillery - - - - - - - -		3	
Royal Engineers - - - - - - - -		2	
56th Regiment - - - - - - - -		6	
Commissariat - - - - - - - - -		1	
Ordnance department - - - - - - -		3	
Officers' wives - - - - - - - -		4	19
Of the Convict Establishment:			
Convicts - - - - - - - - - -		152	
Quartermasters and guards - - - - - -		9	161
Of the Resident Inhabitants:			
St. George's parish (very few of whom were natives) - -		85	
Hamilton parish (none).			
Smith's, child (native) - - - - - - -		1	
Devonshire:			
Adult (not native) - - - - - -	1		
Children (native) - - - - - -	2	3	
Pembroke (including the Town of Hamilton):			
Adults (not native) - - - - - -	17		
Children (not native) - - - - - -	5		
Children (native) - - - - - -	5	27	
Carried forward - - -		116	525

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* The relative mortality among the troops at the several stations (which Governor Elliot wished us to ascertain), will appear from the tabular return thereof inserted in the Appendix.

Report on the Yellow Fever of 1853.

Brought forward - - -		116	525
Of the Resident Inhabitants—*continued.*			
Paget's:			
Adults (not native) - - - - - -	2		
Children (not native) - - - - - -	2		
Children (native) - - - - - -	2		
		6	
Warwick (none).			
Southampton:			
Adults (native) - - - - - - -	2		
Children (native) - - - - - - -	7		
		9	
Sandy's:			
Adult (not native) - - - - - -	1		
Child (native) - - - - - - -	1		
		2	
Ireland and Boaz Island:			
Adults (not native) - - - - - -	2		
Adult (native) - - - - - - -	1		
Child (not native) - - - - - -	1		
Child (native) - - - - - - -	1		
		5	
			138
TOTAL DEATHS - - -			663

This estimate of the number of deaths is believed rather to fall short of than to exceed the reality, as, in the larger parishes, some deaths were, no doubt, omitted to be registered, and some arising from the fever probably were attributed to other diseases.

29. Governor Elliot has called our attention to the dreadful mortality at St. George's, and especially of officers and officers' servants in the Royal Barracks. Those quarters were inspected by the Commissioners, who have no hesitation in declaring their opinion that the underground rooms formerly occupied by officers' servants are totally unfit for that purpose. We insert, in the Appendix, a diagram of the officers' quarters over those rooms. It appears to us that the subalterns' quarters would be adequate and sufficiently ventilated if two rooms were thrown into one, but under the existing arrangements, it is obvious to any person inspecting the premises that from whatever quarter the wind may blow, one or the other of those apartments is shut off from the air; and in this climate, during a large portion of the year, must be very unwholesome.

This observation applies with still greater force to the casemate barracks in Fort Victoria, which are not only much below the level of the ground, but from the narrowness of the inner ditch and the double line of fortification, are so nearly deprived of any circulation of air, as to render them, in our opinion, unfit for habitation, more especially in the summer months.

30. The Commissioners took an early opportunity of inspecting the hulk "Thames," and the Royal Barracks at St. George's.

The Appendix will show the opinion to be almost unanimous, in which the Commissioners concur, that the position of the "Thames" was by no means eligible in a sanitary point of view. From measurements taken, at our instance, it is found that she lay aground on a bank where at low tides the depth of water was as follows:

	BOW.	MIDSHIPS.	STERN.
	Feet.	*Feet.*	*Feet.*
Starboard side (in shore) - - - -	6	3	5 ½
Port side (off shore) - - - - -	6 ½	11 ½	11 ½

Report on the Yellow Fever of 1853.

	Feet.
The distance of the hulk from the cliff - - - - - - -	165
Width of road (along the face of the cliff) - - - - - - -	26
Total distance from the hulk to the nearest edge of the parade ground	191
Height of cliff from the shore to the road - - - - - - -	58
Height from the road to the level of the parade - - - - - -	14
Total height - - -	72
Total height of the hulk from the water to the ridge of the roof over her	40
The distance from the above mentioned edge of the parade to the soldiers' barracks is - - - - - - - - - - - -	161

The foregoing measurements show that at the gangway of the hulk, where the stage led to the shore, the accumulation of mud and filth had reduced the depth of water to about three feet at low tide, and about seven feet at high tide. We have already adverted to the noisome smell produced by the working of the ship on this bank in the gale of the 20th August. When visited by us on the 11th January, the interior of this hulk was found to be in a very satisfactory state of cleanliness throughout, down to the kelson. It was represented to us that her condition was the same at the outbreak of the fever, which is confirmed by Dr. Hall's letter of the 19th December 1853, in which he mentions his inspection of this hulk on the 24th and 25th August. The Commissioners feel it their duty to remark that the two cells called the "black hole," in the lower part of the ship, have no means of ventilation except a small close grating in one, and in the other a sheet of metal pierced with small holes, which we consider in this climate to be not only totally inadequate but positively dangerous. We are, however, informed by one of the witnesses, that no convict had been confined here for more than a few hours at a time for a month or more before the fever broke out. Since our inspection, this hulk has been moved from her former position to moorings in the middle of the harbour, where the ventilation is ample.

31. Before the organization of the commission, Governor Elliot, with the view of exhibiting more clearly the relative positions of the "Thames" hulk, the barracks, the forts, and that part of the town of St. George most severely visited by the fever, had given instructions to the surveyor-general to prepare a plan of that district on a large scale, to accompany our report. In consequence of the minute details in which it was to be executed, the surveyor-general has not yet been able to forward it to us, and we close our report without it, rather than incur further delay.

32. The first subject of inquiry to which our attention is directed by the Secretary of State is, whether the fever had a local origin, and, if so, whether that origin was the position of the convict hulk at St. George's. The detail which we have given of the earliest cases of yellow fever observed in Bermuda in 1853, will show that, before any case had arisen in the "Thames," several had been treated in the "Tenedos" hospital ship, admitted there from the Boaz Island prisons and the hulks at Ireland Island. Dr. Hall refers to one case as early as the 5th July. It must also be remembered, that the cognate diseases of dysentery and cholera had even before that time prevailed extensively among the convicts, both at Ireland and Boaz Irelands, and St. George's, sometimes merging into fever. We would also refer to the previously mentioned cases of Samuel Fox, of St. David's Island, who died there 2d August; and of Mrs. Davis, the soldier's wife, who died at Paget Island on 20th August. Robert Hall, who would seem to have been the earliest case of yellow fever on board the "Thames," died on 16th August. No communication can be traced between these several parties.

When we find that the fever broke out in different and distant parts of the colony so nearly simultaneously, we cannot ascribe its origin solely to the position of the Thames, nor to anything peculiar to the town of St. George, although the defective sanitary condition of some parts of that town rendered it but too liable to aggravate any disease which might show itself.

33. A very general belief is entertained in the community, and participated in by persons of much intelligence and experience of former epidemics, that this fever was imported from abroad. Without undertaking to affirm that yellow fever could not be so imported, the evidence in support of that opinion, as applied to this occasion, has not been such as to satisfy the Commissioners that it was so introduced; and this point is still left involved in much obscurity.

34. On the second head of inquiry, directed by the Secretary of State, nothing has come to our knowledge leading us to believe that the interior of the "Thames" was deficient in a proper state of cleanliness and ventilation, with regard to the sleeping berths and bedding, or other arrangements. The evidence before the Commissioners shows that the epidemic was very much aggravated, both in the number and severity of the cases, by the inadequate hospital accommodation on board of the "Thames" for the sick there. It will be remembered, that this ship lay at a distance of 14 miles from the convict hospital ship "Tenedos" at Boaz Island, and that patients could only be transported thither in boats, subject to the uncertainty and inclemency of travelling on an open sea. We need not repeat here the observation in the Appendix on the necessity of separating the sick from the healthy. But even independently of that consideration, we feel it our duty to point out the absolute necessity of providing some more adequate hospital arrangements for the convicts at St. George's.

35. With regard to the inquiry whether there was anything in the conduct, discipline, or occupations of the convicts which could have predisposed them to fever, we have only to call attention to the expediency of sparing them as much as possible from the quarry labour during the hottest period of the year. This partial remission of labour was adopted in the past summer, on the recommendation of the medical superintendent of convicts.

36. On the fourth subject of inquiry, whether there is any evidence of the malady having been contagious, the Commissioners would especially refer to the answers, in the Appendix, of Mr. Hilditch (deputy inspectorof the Royal Naval Hospital), Dr. Hall (medical superintendent of convicts), Dr. Warner and Mr. Beck, of the same department; Surgeon Parratt, of the ordnance, P.M.O.; Surgeon Innes, 56th Regiment; Assistant Staff Surgeon Munro, Assistant Surgeon Deeble, 56th Regiment. Among the local physicians and surgeons, the answers of Dr. Hunter, Dr. Adolphus J. Harvey, Dr. Hunt, Dr. Parke Tucker, Dr. Godet, Assistant Surgeon Gray, R. N., and also the answers of Mr. Ballingall, naval storekeeper.

These answers show that the persons whom we have named, who had ample opportunities of observation during the recent visitation, and some of them during previous epidemics, and whose competency to form a correct judgment upon the facts cannot be doubted, all concur in the belief that this fever was, under certain circumstances, communicable. Assistant-surgeon Wells, R. N., Assistant-surgeon Lilburn, R. N., Assistant-surgeon Dickey (convict establishment), Assistant-surgeon Knox, 56th regiment, and Dr. Henry J. Hinson, a resident physician, whose experience and judgment entitle them to much consideration, take a different view of this question. Among numerous other cases which happened while the fever was raging was that of the family of Mrs. Cooper, mentioned in the evidence of her husband (Mr. Isaac B. Cooper) and Dr. Parke B. Tucker, and frequently referred to by others. She went to St. George's from a distant parish, where no fever then existed; attended her son for two days, who died at St. George's; returned to her home, was taken with the fever there four days afterwards, and died eight days after her son. Within three weeks from her death, two of her children were taken with the fever, of whom one died; and shortly after his death another daughter was taken with the fever, and recovered after having had black vomit. Up to this time no other case of fever had occurred in this district of the country; and it is observable that this was a family of native Bermudians, who in general are less susceptible of yellow fever than the natives of northern climates.

37. We have already endeavoured to trace, as directed by Governor Elliot, the movements of the several bodies of troops after the dispersion of the garrison from

Report on the Yellow Fever of 1853.

from the barracks. It cannot fail to be observed, from the particulars stated in the Appendix, that on one point, viz., the beneficial effects resulting from the separation of the force, and their removal in small parties to airy and healthy localities, all the witnesses, medical, military, and civil, including the local functionaries and persons of greatest experience in the colony, are entirely agreed. This naturally leads us to suggest (in addition to the propriety of affording ample space and ventilation, and observing strict cleanliness in all places where numerous bodies of either soldiers or convicts are congregated) the importance of making timely provision for the separation of the troops whenever the advance of the season or the appearance of any premonitory sickness may induce an apprehension of epidemic disease. In connexion with this point, we are reminded, by the difficulty and delay unavoidably experienced last year in the removal of the convicts and troops when that measure was finally decided upon, of the inadequate means of transport at present available for that purpose, and the desirableness of increased facilities of this nature.

38. Considering the great preponderance of the opinion as to the communicability of yellow fever, of the type which prevailed here last year, and the certainty that small-pox and other eruptive fevers are contagious, and can be imported into this colony from some of the countries from which we are distant only a very few days' sail, the Commissioners are convinced that more stringent and effective quarantine regulations than those which now exist would be conducive to the public welfare. The enforcement of quarantine laws must of course in great measure depend upon the vigilance and activity of the health officers, and it seems unreasonable to expect from those functionaries in Bermuda a great sacrifice of their time and exercise of their skill in the performance of duties laborious, responsible, and at times exceedingly invidious, when we look at the scanty emoluments at present annexed to their office. The Commissioners learn that the fees of each of the health officers, on an average of several years past, have not exceeded 5 *l.* per annum. The suggestions made by the provost-marshal general, that these officers should be amply paid, and the place held in conjunction with some military or naval appointment, and the office disconnected from all other sources of profit, appear to the Commissioners deserving of much consideration. But in carrying into execution quarantine laws with any degree of strictness, it is impossible to overlook the necessity of providing at the ports, on some insular and detached spot, suitable quarantine houses. It appears to us inhuman to require the crews and passengers of vessels filled with infection, at the risk of their lives, to remain on board, in narrow cabins, unattended by nurses, and unprovided with articles of the first necessity. If quarantine laws are to be enforced (and if not enforced, they had better be abandoned), some provision should be made for the accommodation on shore of persons arriving here in vessels subject to quarantine; and without some such provision, the Commissioners apprehend that all quarantine laws will become nugatory.

39. In conclusion, the Commissioners cannot but feel that in making this report, at the termination of the important inquiry confided to them, they have been compelled to give but a faint outline of the great mass of facts, opinions, and suggestions collected in the course of their investigation; and they venture to hope that the fuller details contained in the Appendix, and especially in several of the able and instructive returns with which they have been favoured, will in great degree supply this deficiency, and tend to the adoption of measures which, under Divine Providence, may be not wholly ineffectual in protecting this little community from a recurrence of the fearful malady with which it has been so heavily afflicted, and in restoring its wonted character for salubrity.

We have, &c.
(signed) *S. Oakeley*, Lieut.-colonel 56th Regt.
John Harvey Darrell, Attorney-general.
D. Stewart, Solicitor-general.

APPENDIX

APPENDIX TO THE REPORT.

Appendix.

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No. 1.

(No. 54.)

Sir, Downing-street, 24 October 1853.

Her Majesty's Government are desirous that immediately on your arrival at Bermuda, the government of which you are about to resume, you should institute a careful and searching inquiry into the origin and causes of the frightful mortality from yellow fever of which we have received accounts by the last mails.

This inquiry should be directed not merely to ascertaining whether there was any culpability on the part of the officers in charge of the convict and other establishments, but with a view to discover any means by which similar calamities may be prevented or mitigated in future.

The special points to which your inquiries should be directed are,

First, Whether the fever had a local origin, and if so, whether that origin was the position of the convict hulk at St. George's Harbour, which is represented to have been moored close to the shore and embedded in filth, in which her position had recently been slightly changed by shortening the mooring chains.

Secondly, Whether the condition of the interior of the ship was in a proper state of cleanliness and ventilation, especially with regard to the sleeping berths and bedding.

Third, Whether there was anything in the conduct, discipline, or occupations of the convicts which could have predisposed them to fever.

Fourth, Whether there is any evidence of the malady having been contagious.

These inquiries should not be confined to the convict hulk, but should extend to every other probable source in which the fever could have originated.

You will call upon the medical officers and others in the different departments of your Government to supply you with all the information which it may be in their power to afford on this subject, and embody the whole, with your own observations, in a faithful report.

I have, &c.
(signed) *Newcastle.*

Governor Elliot,
&c. &c. &c.

No. 2.

(L. S. M.)
(signed) *Charles Elliot.*

Bermuda *alias* Somers' Islands. } By his Excellency *Charles Elliot*, Esquire, Captain in the Royal Navy, and Governor and Commander-in-Chief in and over these Her Majesty's Bermuda or Somers' Islands, &c. &c. &c.

To Major *Soulden Oakeley*, of Her Majesty's 56th Regiment of Foot, commanding Her Majesty's Troops in the said Islands, *John Harvey Darrell*, Esquire, Her Majesty's Attorney-general for the said Islands; *Duncan Stewart*, Esquire, Her Majesty's Solicitor-general for the said Islands, and Major *Arthur William Byles*, of Her Majesty's 56th Regiment aforesaid, greeting;

Whereas a malignant fever has prevailed in these Islands during the summer and autumn of the present year, which has been attended with great mortality, especially among Her Majesty's land forces stationed in these islands, and the convicts transported here from the United Kingdom to be kept to labour upon the public works, and the officers of those establishments. And Her Majesty's pleasure has been signified to me the Governor aforesaid, in a despatch from his grace the Duke of Newcastle, one of Her Majesty's Principal Secretaries of State, bearing date at Downing-street, the 14th day of October now last past, that I should institute a careful and searching inquiry into the origin and causes of that mortality, and with a view to discover any means by which similar calamities may be prevented or mitigated in future: Now, therefore, know ye that I, the Governor and Commander-in-chief aforesaid, by virtue of the power and authority in me vested for the good government and chief command of these islands, and in pursuance of the instructions communicated to me as aforesaid, have thought fit to constitute and appoint, and by these presents do constitute and appoint you the said Soulden Oakeley, John Harvey Darrell, Duncan Stewart, and Arthur William Byles, jointly and severally Commissioners, and do hereby authorise and empower you by all lawful ways and means whatever, to make inquiry into the origin, causes, and particular circumstances of the malignant fever aforesaid, and of any means by which similar calamities may be prevented or mitigated in future; and especially to inquire whether there was any culpability on the part of any of the officers in charge of the convict and other establishments aforesaid, with reference to that mortality, and whether the fever had a local origin; and, if so, whether that origin was the position of the convict hulk "Thames" at St. George's Harbour; whether the interior of that ship was in a proper state of cleanliness and ventilation, especially with regard to the sleeping berths and bedding; whether there was anything in the conduct, discipline, or occupations of the convicts which could have predisposed them to fever.

Whether there is any evidence of the malady having been contagious, and further to inquire into every other probable source in which the fever could have originated; and to report to me upon all and singular the matters aforesaid without delay. And all officers civil and military in the said islands are hereby required to be aiding and assisting unto you in conducting the said inquiry; and for so doing this shall be your warrant.

Given under my hand and the Great Seal of these Islands, this 16th day of December 1853, and in the 17th year of Her Majesty's reign.

By His Excellency's command,

(signed) *Robert Kennedy.*

No. 3.

Gentlemen, Clarence Hill, Bermuda, 16 December 1853.

I HAVE the honour to forward to you a commission under the seal of the colony, authorising and empowering you to conduct the inquiry directed in the Secretary of State's despatch, No. 54, already transmitted to you in my letter of the 7th instant.

2. I have not associated any medical officer with you, because it has appeared to me, after much deliberation, that it would be better for all the ends in view, as well as more satisfactory to those gentlemen, that they should have the opportunity of stating the result of their personal observation during the late or any other fever of a similar kind, in the medical treatment of which they have taken a part, and any opinions they may have formed upon that experience, by the way of written replies to written questions. But in all cases where you may consider it necessary for enabling you to exhibit a more distinct statement of testimony and the conclusions founded upon it, you will of course pursue the subject by *vivâ voce* examination.

3. In order that you may clearly apprehend the extent and description of information which it seems to me Her Majesty's Government will desire to obtain concerning the origin of the late dreadful visitation, and the concurrent causes which may be supposed to have aggravated it, I transmit the accompanying list of questions for your disposal.

Appendix.

4. You will be so good as to understand it to be my wish that these, or any other questions which you may decide to put, in the first place, should be printed with a sufficient proportion of blank leaves interposed for the convenience of inserting the replies. A certain number of copies will then be sent to the heads of the several medical departments in the colony, viz., the deputy-inspector of the naval hospital, the principal medical officer, and the medical superintendent of the convict establishment, requesting that the papers may be circulated amongst the medical officers under their authority, who have been engaged in the treatment of the sick during the late epidemic, and returned to the Commission as soon as they have been filled up. I would also wish that separate copies of questions which the Commission may desire to put to any of the private practitioners of the colony, should be printed and forwarded to them. I have marked such as have occurred to me, with letters of the alphabet.

5. I consider it to be a point of high importance to ascertain the proportion of cases which terminated fatally to the strength in the occupation of each barrack and fort in the colony, at the period when the fever broke out in a general form, and I therefore transmit for your information the copy of a letter which I have addressed to the major commanding the troops upon that subject. I also transmit a return which I have procured from the medical superintendent of the convict establishment, showing the number of officers and convicts actually victualled in each hulk and prison in the colony on the 18th July last, the numbers attacked by fever, and the number of cases which ended fatally. I also forward a statement I have drawn up for my own use, from such information as I have been able to collect from military and other returns before me. I should remark, however, that this information is neither as correct as I could wish, nor is it brought down to the present date. It is therefore only to be considered as a memorandum for your guidance in the preparation of a more complete and accurate return, brought down to the present date, of the per-centage of cases which ended fatally, distinguishing each arm of the garrison, and the per-centage on the strength both of troops and convicts at St. George's, Hamilton, and Ireland, dating from the 1st of August, *i.e.*, before the fever broke out in a general form.

6. The dreadful mortality at St. George's will of course engage your particular attention, and I have to direct your especial notice to the formidable loss of officers at that point, and especially of officers' servants in the Royal Barrack. It appears that of 26 soldiers employed as officers' servants in that barrack, every single one was attacked, and 20 died. The quarters occupied both by the officers and their servants must be particularly described and reported upon.

7. It is of much interest to ascertain the effect of the separation of the force, and of the segregation of the infected from the healthy, you will, therefore, follow the proceedings of that kind during the late epidemic with particular attention. The formation and result of the hospital depôt at Ports Island, and the effects of the removal of part of the strength from Ireland Island to Tucker's Island should be carefully examined. It will also be important to trace the progress of the fever on the strength removed to the Ferry Point, and afterwards on the detachments at Devonshire, Prospect Hill, and Oxford, and to specify to what extent the small detachments at Mount Langton and Gibbs' Hill have escaped the fever.

8. You will be very careful, in your inquiry respecting the hulk "Thames," to ascertain the quantity of prisoners' bedding burnt immediately under the barracks; the date of that proceeding; by whose order it was carried into effect; the direction of the wind and the state of the temperature at the time, as well as the state of health of the troops in the Royal Barrack before the burning took place, and immediately afterwards.

9. The Enclosure, No. 6, is the copy of a memorandum of mine, dated 18th December 1848, directing the observance of certain sanitary precautions in the hulks, and you will be so good as to report whether these precautions were regularly carried out in the hulk "Thames." The medical officers of the respective hulks were required to sign their initials to a statement in the weekly reports, setting forth whether these precautions were observed or not, and, so far as I know, there was no interruption of those certificates in the weekly reports from the "Thames."

10. It

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10. It is my particular desire that you should institute most searching inquiry into all the circumstances connected with the visit of the Spanish war steamer "Velasco de Garay," arrived in Murray's Anchorage on Sunday the 22d of August, after a passage of six days from the Havana. It appears from information which has subsequently reached the colony, that yellow fever was raging there at that time and for some weeks before, and it is essential to ascertain whether the visit to her by the health officer was strictly performed; whether any persons had died on board of her during the passage from Havana, or during her stay in this colony; and particularly, how soon after she had left, any of the officers or other persons who had been in the habit of visiting her were attacked by fever, and if so, whether any of these persons died, and the date of their decease.

11. It is also necessary to institute similar inquiry respecting the brigantine "Charles," arrived at the quarantine station, Granaway's Deep, on the 10th October last, reported 18 days from Demerara, and bound for Newfoundland, having the body of the captain's wife on board, reported to have been ill during the whole of the passage, and deceased on the evening of the 9th. It has been represented to me that this vessel had the quarantine flag hoisted during her run across the Great Sound, on the 10th October; that the body of the deceased lady was buried in Paget's churchyard on the 11th October; and that the second mate died whilst the brigantine was at the quarantine station in Granaway's Deep.

12. I have directed the officers of the convict department to afford you all the facilities which you may require for the effectual pursuit of this investigation, and the officer commanding the troops will also, I am persuaded, afford you every information which may be necessary, so far as the military departments are concerned. The naval authorities will be equally ready to fulfil the desire of Her Majesty's Government for a full report into all the circumstances connected with this epidemic, and I have requested Mr. Ballingall to afford you all the information and assistance in his power, so far as the naval establishments at Ireland Island are concerned.

13. This truly momentous investigation involves interests of the deepest importance to the Queen's Government, to all those persons in the public service who may be serving, or hereafter called upon to serve in this colony, and to all the people of the island. The calamitous loss which has befallen the colony during the past three months, has cast the administration of the Government upon two officers of your body; with the other two functionaries composing it, I have had the advantage of a long and intimate official intercourse. Under these circumstances it is easy for me to assure you of the entire confidence with which I devolve this serious duty upon you. It will be discharged, I am convinced, not merely with scrupulous attention and ability, but with complete disregard of any other than public considerations, and dispassionate freedom from prejudice.

14. You will be so good as to keep accounts of all expenses incurred by you in the course of this investigation, for travelling, printing, copying papers, and any other charge incidental to its effectual conduct.

I have, &c.
(signed) *Charles Elliot,*
Governor and Commander-in-Chief.

Major Oakeley, 56th Regiment, &c. &c. &c.
The Attorney-general, the Solicitor-general and
Major Byles, 56th Regiment.

Appendix.

No. 4.

Questions.

QUESTIONS on the subject of the late YELLOW FEVER in *Bermuda*.

1. How long have you been in Her Majesty's service, and in what branches of it, and in what climates?

2. What has been your former experience of epidemic visitations generally?

3. At what date during the late epidemic fever did the first case come under your personal observation?

4. Where did that case originate? and describe the history of the patient's situation, preceding movements, changes of position, and other circumstances connected with the attack as carefully as you can. Did it end fatally or otherwise; and if so, was it a well-defined case of black vomit?

5. Describe the nature and extent of your practice during the late epidemic fever, 1853.

6. State your present opinion as to the origin and nature of that epidemic fever.

7. Is that opinion different; and if so, in what respects, from the opinion you entertained before the breaking out of this fever in a general form?

8. Do you think it is communicable or not? Mention any instances which have confirmed you in that opinion.

9. Under what circumstances may it become communicable, in your opinion?

10. If you are of opinion that this fever was imported, how do you consider that it was introduced; and state the particular grounds of your belief for attributing it to that particular cause of introduction?

11. Is it your opinion that the specific miasma indigenous to a particular locality, and capable of producing zymotic diseases generally, can, under special circumstances, produce yellow fever?

12. Describe the dietary of the troops, their mode of life, the cubic space allotted to each man, their treatment under disease, with regard to the separation of the sick from the healthy, their general distribution and the localities they occupy, as these may affect their sanitary condition.

13. Beyond the liability to disease which aggregation engenders, is there anything in the situation of the soldier which would render him, in your opinion, more than usually susceptible of a fever attack of this nature?

14. Apply all these particulars very specially to the force in the occupation of that part of the colony with which you have been most familiar (St. George, or Ireland, or any other station, as the case may be).

15. Describe any particulars in the localization of the troops at that point, which could affect them unfavourably or otherwise. Describe the localities, capacities, conveniences, and general eligibility or not of the hospitals with which you are familiar at Ireland, or St. George's, or other stations, as the case may be.

16. Say how long you have been stationed at St. George's and the other stations, and in what capacities, and to what periods of the year 1853.

17. Describe the nature of the soil, its natural characteristics, as well as its acquired properties. Describe the town of St. George, its situation relatively to the barracks and quarters in the forts, the means of draining it, the precautions taken to keep the small houses, lanes, and back yards clean, the extent and influence of the tides there, the situation and circumstances of the burial ground, the situation of the slaughter-houses, the number of cattle usually slaughtered there per week, whether pigs are frequently kept in the town or not, and any other circumstances bearing upon the probability of fever being engendered or aggravated by the situation and condition of the town of St. George.—Apply these

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Questions.

these particulars to any other post (besides St. George) where you have been stationed.

18. How is the night soil disposed of in the towns of St. George's and Hamilton? Have the houses cesspools or not, and how often are the cesspools cleaned out or not, speaking generally?

19. What is the previous history of St. George's as to epidemic diseases, and to what extent relatively have its native and adventitious populations suffered?—Apply this to any other post where you have been stationed.

20. State the number and description of the force in each quarter or barrack when the disease broke out.

21. What means were adopted on the appearance of the disease for arresting its progress? and state the several dates of those measures as accurately as you can.

22. Describe the dietary of the convicts so far as it is known to you, their mode of life, the cubic space allotted to each man, their treatment under disease with regard to the separation of the sick from the healthy, their general distribution, and the localities they occupy, as these may affect their sanitary condition.

23. Apply all these particulars very specially to the "Thames," so far as may consist with your knowledge.—Apply these particulars also to any other convict hulk in which you served in 1853, and to the prisons at Boaz Island.

24. How long had the hulk "Thames" been moored in St. George's Harbour, was her position there a good one in a sanitary point of view, or one likely to originate disease, in your opinion?

25. Is fever of any kind endemic to Bermuda?

26. What are the states of atmosphere, temperature, and wind most favourable to the spread of yellow fever at Bermuda?

27. Have you any means of comparing these conditions during the fever of 1853 with the same conditions in former fever years?

28. Was the temperature higher or lower in 1853, and did more rain fall or otherwise during the hot weather than is usually the case during the same season?

29. What constitutions, or class of persons are most predisposed to fever?

30. Are the inhabitants of the colony more exempt from yellow fever than Europeans? Is there any difference in this respect between males and females, adults and children, white and coloured persons?

31. Is it your opinion that it can be communicated by direct contact with the person suffering from it, or with the dead body of one who died of it, or with articles of dress or bedding used by either?

32. Do you think that yellow fever may be produced in unfavourable states of atmosphere at Bermuda by emanations from decayed vegetable or animal substances, or both?

33. What have been found the best means of prevention? And what would you suggest for this purpose in Bermuda?

34. What measures do you recommend, in case of a recurrence of fever, to arrest its spread?

35. State, if it is known to you, the result of separation of the force in arresting the spread of the disease.

36. Why does yellow fever appear so seldom in Bermuda?

37. Do you know the proportion of mortality amongst the natives compared with that amongst Europeans?

38. Can you give any further information, or offer any suggestions, which appear to you material, with reference to the present inquiry?

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Questions.

39. State as accurately as you can the number of cases of yellow fever which occurred in your parish between the 1st July and 31st December 1853, and the number of such persons who died of that disease within that period, exclusive of persons on the naval, military, and convict establishments, and furnish a nominal list of those who died.

40. Are you aware of any infringement of the quarantine laws during that period? and if so, state the particulars.

No. 5.

Answers of *James Hall*, M.D., Medical Superintendent of Convict Establishment.

Answers of James Hall, M.D.

1. Above 45 years, as medical officer in the Royal Navy.

2. I have witnessed various epidemic diseases in different parts of the world, especially of yellow fever in 1843, and in the present year in the convict establishment here.

3. On July 5th of the present year.

4. At Boaz Island. Patient a convict, named W. Foreman; age 21, of slight make; never before at hospital; labourer. Arrived in "Ascendant" February 1852. Attacked with fever July 3d. Received in hospital 5th. Symptoms those of a bilious remittent of the hot season; but in the course of the disease obscure signs appeared of yellowness of the eyes, watery black stools, affection of the brain, and other symptoms peculiar to yellow fever were obscurely marked; but no black vomit. Died on the 5th day from admission.

5. The extent of my practice was over about 480 cases of fever. The principles of my practice were directed to counteract in each individual case the effects which the pestilential virus was producing in the body, tending to destroy life.

6. In my opinion the fever owed its origin to some peculiar atmospheric constitution acting on the vital powers of those susceptible to its influence as a poison.

7. Yes. Certain circumstances had led me to believe that fever would extensively prevail during the hot season, and be of the common form of bilious remittent.

8. Yes; for I have witnessed numerous instances of its infectious power when concentrated.

9. When the air around a patient suffering under a severe form of this or any other continued fever is impregnated with exhalations from his body.

10. My opinion is, that the fever was not imported; I think that this, like other pestilences which occasionally appear, first mildly in form, gradually increasing in intensity, then diminishing, and finally ceasing, was one of the many operations of nature not understood by man, yet tending to his good.

11. A specific miasm will produce a disease peculiar to its essence; and hence in various places peculiar diseases prevail among those who inhabit or visit them, and hence originate endemic diseases, such as ague and dysentery.

12 to 21. Unanswered.

22. Each convict receives, weekly: fresh meat, 4 lbs.; salt pork, 1 ½ lbs.; soft bread, 7 ½ lbs.; biscuit, 1 lb.; vegetables, 2 lbs.; rice, 12 oz.; cocoa, 5 ¼ oz.; tea, ⅞ oz.; sugar, 1 lb. 5 oz.; rum, 3 ½ gills. They are employed variously on the public works, and at their respective trades. No established (measured), but ample space allotted to each; much more than to each sailor on board a ship of war. The sick are separated from the healthy, and treated in a small ward, if their cases are slight; but if severe, as fevers, &c., they are ordered to be sent to the "Tenedos" hospital ship.

23. The position of the "Thames" as a prison hulk was unfavourable to the health of the prisoners confined on board at night at the hot season of the year, although the space they occupied between decks was ample, and every attention given to ventilation and cleanliness of the ship by the overseer in command of her.

24. Over nine years. The position was a very bad one in a sanitary point of view, not likely to generate fever under the observance of the usual regulations as to cleanliness, ventilation, &c., but very susceptible of epidemic disease, and vastly increasing its intensity if the sick were not removed from the ship.

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Answers of James Hall, M.D.

25. Only the bilious fever during the summer.

26. Clear atmosphere, high temperature, and light winds from east to south.

27. Yes; having witnessed in 1843 the rise, progress, and decline of that fever among the convicts and other persons, and having myself suffered from it.

28. From July to September in 1843 the temperature and general state of the weather with respect to calms, light winds, and quantity of rain were apparently similar to those which prevailed during the same period of the present year.

29. Presuming yellow fever is meant, the persons most susceptible are new comers from a northern climate, those of irregular habits, and invalids.

30. They are; because they are acclimated, more virtuous in their habits, and more temperate in their mode of living.

31. The communicability of this disease, from the causes mentioned, will depend on contingencies, because the force or quantity of a pestilential febrific virus in any individual case cannot be known, except by its effects, nor can the unsusceptibility of it in a healthy individual be predicated.

32. No; but from such sources co-operating with other agencies, and acting on individuals living in an ill-ventilated place, such, for example, as a convict hulk, a typhoid fever, as well as scurvy and dysentery, may be generated.

33. Cleanliness, free ventilation, and early dispersion of the sick from the healthy.

34. On all occasions early recourse to medical men of experience and sound judgment, and a rational application of the laws of quarantine.

35. On board the "Medway" and "Dromedary" hulks, and Boaz Island prisons, containing in the whole 1,100 prisoners, only 265 were attacked, because each individual case, immediately it appeared, was sent to the "Tenedos," and thereby no pestilential focus was formed in either of those localities.

36. The visitation of epidemics at Bermuda, at distant and irregular intervals, is owing to some cause as unknown as that which occasions the occasional visitations of hurricanes here.

37. I do not.

38. Unanswered.

(signed) *James Hall*, M.D.,
Medical Superintendent of Convict Establishment.

Additional Questions to Dr. *Hall*.

1. You say the temperature, contrasting the year 1843 with 1853, was very similar. In these two years, as compared with others, what was the state of the weather and temperature?—The temperature in 1843 and 1853 was higher, and greater calms prevailed.

2. Can you state the number of fatal cases of yellow fever which occurred at Ireland Island previous to the reception of any patients from the "Thames" hulk; and if so, the dates of their decease?—There were three fatal cases of yellow fever on board the "Tenedos" hospital ship, and they occurred respectively on the 9th July, 25th July, and the 8th August.

3. Were these fatal cases admitted from any of the hulks, or from whence?—From the establishment at Boaz Island, and from the hulks at Ireland Island.

4. Were there any other cases of yellow fever admitted from the same locality at about the same period, which did not terminate fatally?—Yes.

5. With respect to the convict establishment, have any measures suggested themselves to you by which a similar calamity may be prevented in future, or its evils mitigated?—In the event of a recurrence of the calamity, I should recommend the lodging of the prisoners in suitable barracks on shore, and an hospital adapted for the reception of sick labouring under an epidemic disease.

6. Can you state if any, and what directions were given respecting the removal of prisoners attacked with yellow fever on board the "Thames" to the "Tenedos" hospital ship?—I know of no orders given to interfere with the usual regulations. On the 15th June, in consequence of the prevalence of malignant cholera, it was recommended by letter that patients whose removal to the hospital ship "Tenedos" at Ireland Island might be productive of risk to life

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Answers
James Hall, M.D.

life or aggravation of their disease were to be retained on board the "Thames," and there treated. But this was only an exception to the usual practice of sending all hospital patients from the "Thames" to the "Tenedos."

LETTERS, &c.

"Tenedos" Hospital Ship, Bermuda,
6 June 1853.

Sir,

I REGRET having to inform your Honor of the presence of the disease termed "cholera" among the convicts.

The occurrence of this disease is customary here at this season of the year, and it always affects the most susceptible of the infirm or unacclimated prisoners, but has been hitherto seldom attended with mortality.

Your Honor will therefore, I am sure, receive with pain the information that among many of the cases of cholera that have presented themselves during the last few days a degree of malignity of this disease has presented itself, of which two prisoners have died within the last 24 hours; and from the many severe cases of dysentery that have been admitted into this hospital during the last two months, I apprehend that much sickness will prevail among the convicts during this summer.

I am happy in acquainting your Honor that fever has not yet appeared in the convict establishment.

I have, &c.
(signed) *J. Hall*, M. D.,
Medical Superintendent.

His Honor Colonel Phillpotts.

"Tenedos" Hospital Ship, Bermuda,
9 July 1853.

Sir,

I BEG leave to acquaint your Honor of the death of the officer named in the margin,* on board this ship, on the 8th instant, from delirium tremens.

I take this opportunity to inform your Honor that epidemic cholera still continues to prevail among the convicts, but to a less extent than before, and is of a milder form; and I think it probable that this disease will be succeeded by fever, of which a few cases have recently appeared, and among them one has proved fatal.

(signed) *J. Hall*, M. D.,
Medical Superintendent.

His Honor Colonel Phillpotts,
&c. &c. &c.

EXTRACT from Letter to Colonel *Phillpotts*.

"Tenedos" Hospital Ship,
10 July 1853.

Sir,

I BEG leave to forward to your Honor the medical report of the convict establishment during the last quarter. I regret having to observe that the health of the prisoners during the greater portion of that period has been very much impaired by the presence of severe "cholera," which has extensively prevailed among them. In many cases it appeared in a most malignant form.

Although the number of cases attacked, as shown by the return, has been great, yet the relative mortality has happily been small.

This disease still prevails, attended with dysentery, and also fever. Of this disease cases are daily presenting themselves, but the character of it is at present only of the common type of fever of the hot season. Although several cases have been admitted, yet one only has proved fatal.

(signed) *J. Hall*, M. D.,
Medical Superintendent.

His Honor Colonel Phillpotts,
&c. &c. &c.

"Tenedos" Hospital Ship, Bermuda,
16 July 1853.

Sir,

I BEG leave to forward to your Honor the medical report of the convict establishment during the last quarter.

I regret having to observe that the health of the prisoners during the greater portion of that period has been very much impaired by the presence of severe cholera, which has extensively prevailed among them.

In many cases it appeared in a most malignant form.

Although the number of cases attacked, as shown by the return, has been great, yet the relative mortality has happily been small.

This disease still prevails, attended with dysentery and also fever; of this disease cases are daily presenting themselves, but the character of it is at present only of the common type of the fever of the hot season. Although several cases have been admitted, yet one only has proved fatal.

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* Mr. J. Conner, steward, "Medway" hulk.

The causes of the sickness among the prisoners are to be found in atmospheric changes of condition, and the physical and moral condition of such men as constitutes a body of convicts employed on public labour in a hot climate.

The alterations which your Honor was pleased to direct should be made in the dietary of the prisoners, has greatly tended to invigorate their health, by counteracting the impressions made on it by the causes before mentioned.

I have, &c.
(signed) *J. Hall*, M. D.,
Medical Superintendent.

His Honor Colonel Phillpotts,
&c. &c. &c.

Sir, "Tenedos" Hospital Ship 29 August 1853.

It is with much regret I acquaint your Honor of the uniform advance in severity of the prevailing epidemic fever among the convicts on board the hulks in the Camber, and in the prisons on Boaz Island, and of the many relapses among those who were discharged as convalescents to the hulks in the Camber, and the prisons on Boaz Island, which unfortunate circumstances cause the hospital ship to be constantly filled.

I consider it therefore my duty to recommend to your Honor, that the prison (B.) be appropriated for the reception of all the convalescents from the hospital ship during the continuance of the present fever, and that these men be put on the half diet of hospital rations, till they become fit for labour in the public works.

I further beg leave to recommend that a portion of the prisoners on board the "Medway" be removed to the "Dromedary," so as to leave the former ship as little crowded as possible during the prevalence of fever on board that hulk, and further that the prisoners employed in the quarries be spared as much as possible during the heat of the day.

I have, &c.
(signed) *J. Hall*, M. D.,
Medical Superintendent.

His Honor Colonel Phillpotts,
&c. &c. &c.

Sir, "Tenedos" Hospital Ship, 10 September 1853.

In forwarding the weekly report I beg leave to enclose a requisition for medicines, &c., for the convict establishment for the year ensuing.

It is with regret I acquaint your Honor that the epedemic fever continues unabated among the officers and prisoners here, but the mortality from this cause has hitherto been very small in the hospital ship.

I have, &c.
(signed) *J. Hall*, M. D.,
Medical Superintendent.

His Honor Colonel Phillpotts,
&c. &c. &c.

Sir, "Tenedos" Hospital Ship, 20 October 1853.

It is with deep regret that in the quarterly medical return which I have now the honor to forward to you for transmission to the Secretary of State, I have had to record so many deaths among the officers and convicts during the last quarter.

I have already stated to your Honor that this awful yellow fever which has caused such dire distress among all classes, has been an epidemic of endemic origin, and not a foreign one. Its devastation in these islands has been partial, according as local circumstances have favoured the power of the pestilential poison. This partial distribution of an epidemic has always been observed at these islands at every visitation of fever, from the earliest records in the history of the Bermudas. As the recurrence of epidemic fever in these islands has been irregular in its periods of visitation, as also have been irregular the symptoms of the disease, and the effects which resulted on each occasion of its appearance.

The present epidemic has shown, in many cases, an intensity of malignity not often observed. The proof of this I have with pain seen, for many of the nurses and attendants on the sick in this hospital have fallen victims. Neither have any assistants nor myself been perfectly insensible to its force. Dr. Crane, as your Honor is aware, is now obliged to retire from this service, in consequence of ill health from fever.

I would here observe, respecting a question of great importance in a public consideration, that although this fever has not exhibited any proof of a contagious power, yet the evidence has been strong of its infectious and communicable influence under favourable conditions; for many patients whilst under treatment for various diseases in the different wards of this hospital took the fever and died. Yet at no time was there any concentration of the fever cases in wards where the most perfect ventilation was not maintained, as well as cleanliness, and the employment of disinfectants in all parts of the ship, from the hold upwards.

It may be as well to observe here, that whilst judicious medical treatment, employed according to the peculiarities of each individual case, has, under Divine blessing, preserved the

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Answers of James Hall, M.D.

the lives of numerous persons, yet in many other cases I witnessed with deep pain my total inability to counteract the malignity of the febrile poison diffused throughout the body, and hastening its destruction.

I feel happy in communicating to your Honor my opinion that the fever is now much milder in power; and I hope that as its force commenced from a high temperature, so it will be soon entirely broken up by the approaching cold season.

I have now to crave the indulgence of your Honor in asking permission to lay before you a list of the prisoners who have survived, after having suffered severely in their health by their unwearied labours day and night in attendance on the sick and dying, not only during the present epidemic, but also during the short but severe visitation of Asiatic cholera which, in the month of May, ushered in the present fever.

During that period it was a common occurrence for men to be brought on board wrapped up in blankets from the hulks and prisons at all hours of the night, writhing under agonies from cramp, and terrifying the nurses; I therefore conceive that your Honor will consider it a humane as well as a pleasing duty to represent the services of these sick attendants, and favourably submit their names to the merciful consideration of the Secretary of State for their pardon.

I have, &c.
(signed) *James Hall*, M.D.,
Medical Superintendent.

His Honor Major Oakley, Acting Governor,
&c. &c. &c.

"Tenedos" Hospital Ship, Bermuda,
19 December 1853.

Sir,

I HAVE the honour to lay before you my replies to the questions which your Excellency, in your letter of the 12th instant, directed me to make on the subject of the late epidemic yellow fever.

I have endeavoured to base my replies on those facts alone which came under my observation at the bed-side of the patients, throughout the whole course of the epidemic.

Despatch No. 54, 24 Oct. 1853.

I think it my duty here to state to your Excellency, in reference to the remarks made by Her Majesty's Secretary of State, respecting whether there was any culpability on the part of the officers in charge of the convict establishment, as to the condition of the interior of their hulks with regard to cleanliness, ventilation, state of the bedding, discipline, &c.; that on the 24th and 25th August I visited the "Thames" hulk at St. George's, and inspected all the between-decks, and found the state of that hulk, the condition of the bedding in the sick ward, and the general aspect of the prisoners to be as satisfactory as they had always appeared to me at my previous inspection.

With regard to the "Medway" and "Dromedary" hulks and prisons on Boaz Island, I have at no time observed any condition of them, nor of the prisoners belonging to them, superior to the state and condition that always appeared on board the "Thames." I deem it a justice due to Mr. Harriott, and to the officers of that hulk, as well as to Mr. Kirkham, in charge of the "Medway" (containing above 500 prisoners), likewise to the other officers in charge, that in respect to the late fever, no culpability has existed on their part, from any neglectful observance of the general instructions which your Excellency had long ago established for their guidance.

If any errors were committed on the part of the officers in any locality which tended to augment the power of the late awful pestilence, they will be found in the simple fact, as far as regards the convict establishment, that the fever patients were kept on board the "Thames" (whose complement of prisoners amounted only to the small number of about 209 at the commencement of the epidemic) and there treated, notwithstanding that the established accommodation was only the usual sick berth of a hulk, capable of containing about a dozen bed patients. When the number of fever patients increased, as it progressively did, to a fearful amount, the difficulties that must necessarily have attended their treatment, nursing, &c., may be readily conceived by your Excellency, because that vessel possessed neither the arrangements nor the accommodations of an hospital hulk.

I beg leave to illustrate this fact by laying before you the enclosed description of the size and accommodations for the sick of the "Tenedos" hospital ship; but on this important subject, from the experience I have had here of two awful visitations of yellow fever, I beg leave to urge on your Excellency the expediency of establishing an hospital of suitable size on Boaz Island.

I cannot conclude this letter without expressing the pleasure it affords me in being able to solicit your Excellency's notice to the present weekly return, which shows the number of patients on board this ship (convalescents included) to be only 99, of which 16 are bed patients, but no case of fever; whereas in the month of September, the number of the former was 260, and of the latter 170, among which many were cases of malignant fever.

I have, &c.
(signed) *James Hall*, M.D.,
Medical Superintendent.

His Excellency Governor Elliot,
&c. &c. &c.

"Tenedos" Hospital Ship,
21 December 1853.

Sir,

In reply to your inquiry, how many cases of fever were admitted into this hospital from the 9th July to the 29th August, I have the honour to inform you that the number was as follows; viz.

From "Medway" Hulk and "Dromedary" - - - -	92	- Ireland.
Prisons on Boaz Island - - - - - - - -	28	
Total - - -	120	

With respect to the dietary of the prisoners, it is the same now as it was during the fever. Previous to this, the dietary was increased in the articles of fresh meat and vegetables, in consequence of my representation to Colonel Phillpotts in the month of June, when cholera was prevailing among the convicts.

On my examination on the 19th, the commissioners inquired at what time the first case of black vomit occurred, a question which I could not then answer; but being very solicitous to furnish the Committee with every information in my power on the very important public inquiry in which they are engaged, I herewith forward a list, which will show the number of patients who died presenting the characteristic symptoms of yellow fever, and likewise two cases of recovery after the appearance of those symptoms. I was not aware of this fact till after the examination of my hospital registers.

I will thank you to excuse any trifling discrepancy between dates and numbers in the papers which I laid before the Commissioners, and the one which I now forward; for example, my reply to the third question states, July 9th: whereas the patient was received on the 5th, and died on the 9th; and of the two patients received from the "Thames," one was sent on the 25th August, and died on the 26th; the other was sent as a convalescent, after frequent relapses from fever, and again relapsed after admission into hospital and died, and therefore in the list enclosed one only is marked as from "Thames" direct, and one as attacked whilst under treatment in hospital.

I have, &c.
(signed) *James Hall*, M.D.,
Medical Superintendent.

His Honor Major Oakeley, Commanding the Forces,
&c. &c. &c.

Bermuda, 18 December 1853.

Weekly Medical Return of the State of the "Tenedos" Hospital Ship, from the 12th to the 18th December 1853.

HULKS and PRISONS.	Number remaining in Hospital 12 December 1853.	Number received during the Week.	DISCHARGED.			Number remaining in Hospital 18 December 1853.	REMARKS.
			Cured.	Invalids.	Died.		
Medway - - -	61	2	14	- -	- -	49	This return includes both sick and convalescents, also Mr. Chalmers, guard of prisons.
Dromedary - -	26	- -	7	- -	- -	19	
Thames - - -	1	- -	- -	- -	- -	1	
Tenedos - - -	1	- -	- -	- -	- -	1	
Boaz Island Prisons -	28	3	2	- -	- -	29	
Total - - -	117	5	23	- -	- -	99	

Total number sick on board the hulks "Medway" and "Dromedary" - - - - - -	39
Ditto - - - ditto - - - in Boaz Island prisons - - - - - - - - -	6
Total - - -	45

18th, died, the Rev. R. Mantach, chaplain, from chronic disease of the liver.

(signed) *J. Hall*, M. D.,
Medical Superintendent.

His Excellency Governor Elliot,
&c. &c. &c.

SIZE and Accommodation for Sick on board the "Tenedos" Hospital Ship, at *Bermuda*.

DECKS.	SIZE AND VENTILATION.		Accommodation for Patients.	Will Accommodate	REMARKS.
Upper	46 Feet in length 34 „ breadth 7 „ height	Ventilated by 9 ports, measuring 3 feet by 2½ feet, and 1 hatchway, being 29 feet by 8½ feet	24 cradles	24	The numbers shown apply to accommodation in a case of emergency in a cool season of the year, and the absence of any infectious disease; although during the late epidemic, the number of prisoners on board at one period was 260, out of which number 170 were patients confined to bed.
Middle	108 „ length 34 „ breadth 6 ft. 10 in. height	22 ports, 3 feet by 2½ 1 hatch, 10 „ 5½ 1 ditto 24 „ 4	61 ditto	81	
Lower	96 Feet in length 35 „ breadth 7 ft. 8 in. height	16 ports, 3 „ 14 inches 1 hatch, 4½ „ 5 feet 1 ditto 6 „ 4½ „ 1 ditto 4 „ 4½ „	24 ditto 120 hammocks	24 120	
Officers' Ward	14 Feet in length 10 „ breadth 7 „ height	2 ports, one 3 feet by 2½ „ 2½ „ 1½	2 cradles	4	
		TOTAL	- - -	253	

(signed) *J. Hall*, M. D.,
Medical Superintendent.

His Excellency Governor Elliot,
&c. &c. &c.

"Tenedos" Hospital Ship, 21 December 1853.

A LIST of Patients who died of Yellow Fever in the "Tenedos" Convict Hospital Ship, with under-mentioned Symptoms, between the 9th of July 1853 and 9th of December 1853.

NAME.	Age.	Where from.	When Entered.	When Attacked.	Whether in Hospital; employed as Nurse or Labourer; or under Treatment for other Disease.	Date of Disease.	Symptoms.	
							Eyes and Body Yellow.	Black Vomit.
William Foreman	21	B. I. Prison	5 July 1853	1 July	No	9 July	Yes	No.
James Dunne	26	Medway	20 –	15 –	No	25 –	No	No.
Robert Bentley	30	B. I. Prison	1 August	2 Aug.	No	11 Aug.	No	No.
John Ellis	35	Medway	4 –	6 –	No	25 –	No	No.
John Jones	30	Thames	25 –	- - Received from "Thames;" had fever a fortnight before, and died 24 hours after admission, from sudden effusion on the brain.		26 –	No	No.
William Dunne	34	Medway	17 –	17 August	Dysentery	28 –	No	No.
Thomas Jefferies	21	B. I. Prison	24 April 1852	- - "Tenedos" boatman, having slept one night on board "Thames," and died on 8th day.		2 Sept.	No	No.
Isaac Newby	29	Medway	23 August 1853	20 Aug.	No	7 –	No	No.
George Taylor	30	„	1 September –	10 Sept.	Dysentery	14 –	Yes	Yes.
Peter Stokes	28	„	19 August –	20 Aug.	No	14 –	No	Yes.
James Apshead	42	Dromedary	15 –	12 Sept.	Ophthalmia	15 –	Yes	No.
James Danaher	24	„	27 July –	11 –	Ophthalmia	16 –	Yes	Yes.
Henry Davies	25	Medway	30 August –	10 –	No	17 –	Yes	No.
Joseph Breedon	22	B. I. Prison	2 –	2 –	No	18 –	Yes	Yes.
Richard Chitty	46	Medway	31 –	17 –	Debilitas	19 –	No	Yes.
Michael Cuddy	30	„	18 July –	17 –	Debilitas	20 –	No	Yes.
Samuel Gilbert	18	„	2 March –	14 –	Visceral disease	22 –	No	No.
Patrick Bryan	53	„	17 August –	21 –	Dysentery	23 –	No	Yes.
George Sims	26	B. I. Prison	12 June –	20 –	Ophthalmia	24 –	Yes	Yes.
Mr. J. Perrow (guard)	35	Medway	24 September –	Not known	No	24 –	Yes	No.
Thomas Currie	42	Dromedary	13 October 1850	17 Sept.	Nurse	26 –	Yes	Yes.
William Weard	33	Medway	13 August 1853	20 –	- - Invalid in hospital, for injury of head.	27 –	Yes	No.
Frederick Rose	29	„	14 September –	17 –	No	29 –	Yes	No.
Thomas King	40	B. I. Prison	20 –	25 –	Catarrhus	29 –	Yes	Yes.
George Wilkinson	22	„	18 August 1852	27 –	Barber	1 Oct.	Yes	Yes.
Charles Dobbin	23	Medway	17 August 1853	26 –	Nurse	1 –	Yes	No.
Joseph Halton	25	Dromedary	10 –	24 –	Ophthalmia	1 –	Yes	No.
James Ashman	37	Medway	11 –	27 Aug.	Three relapses	3 –	Yes	Yes.
William Doyle	24	„	29 –	26 Sept.	Ophthalmia	3 –	Yes	Yes.
James Minchin	30	„	3 –	26 –	Epilepsy	3 –	Yes	Yes.
Denis Henan	33	„	2 –	23 –	Dysentery	4 –	No	No.
Michael Abbott	30	Dromedary	24 –	25 –	Nurse	4 –	Yes	No.
Thomas Massey	30	Medway	3 October –	27 Aug.	No	4 –	Yes	Yes.
Anthony Carlton	41	Dromedary	21 September –	25 Sept.	No	5 –	Yes	Yes.
James Grove	30	B. I. Prison	5 October –	5 Oct.	No	6 –	Yes	Yes.
Thomas Hill	26	„	6 –	24 Sept.	Nurse	7 –	No	No.
Henry Martin	33	Medway	16 September –	3 Oct.	Nurse	7 –	„	Yes.
George Savory	27	„	1 –	1 –	Nurse	7 –	Yes	Yes.
Andrew Windsor	24	„	3 July –	4 Sept.	Nurse	7 –	Yes	Yes.
Thomas James	24	„	3 October –	4 Oct.	No	7 –	Yes	No.
John Danes	34	„	1 February 1851	30 Sept.	Labourer	7 –	Yes	Yes.
Alfred Taylor	22	Dromedary	4 October 1853	2 Oct.	No	8 –	Yes	Yes.

NAME.	Age.	Where from.	When Entered.	When Attacked.	Whether in Hospital; employed as Nurse or Labourer; or under Treatment for other Disease.	Date of Disease.	Symptoms.	
							Eyes and Body Yellow.	Black Vomit.
Richard Troynham	35	B. I. Prison	4 August 1851	4 Oct.	Barber	8 Oct.	Yes	Yes.
Edward Fox	31	„	28 September –	16 Sept.	No	8 –	Yes	No.
John Clarke	32	Medway	13 June 1853	4 Oct.	Nurse	8 –	Yes	Yes.
William Sullivan	28	B. I. Prison	13 May –	30 Sept.	Nurse	8 –	Yes	Yes.
William Beckwith	39	Medway	10 June –	4 Oct.	Dysentery	8 –	Yes	Yes.
Charles Melligan	22	B. I. Prison	11 September –	17 Sept.	Cholera	9 –	Yes	No.
John Croker	30	Medway	4 July –	6 Oct.	Fractura	10 –	Yes	No.
William Grady	28	Dromedary	24 January 1851	5 –	Labourer	11 –	Yes	Yes.
George Haddlestone	22	Medway	27 June 1853	4 –	- - Dispensary labourer.	11 –	Yes	Yes.
William Selby	21	Dromedary	30 May 1851	8 –	Dispensary clerk	12 –	Yes	Yes.
James Malone	28	Medway	28 Septemb. 1853	7 –	Nurse	13 –	Yes	No.
John Gremar	24	„	11 October –	10 –	No	13 –	Yes	Yes.
Patrick Keane	32	B. I. Prison	30 September –	5 –	No	13 –	Yes	No.
Edward Dadswell	30	„	15 May 1851	11 –	Labourer	17 –	Yes	Yes.
John Turner	25	Medway	29 Septemb. 1853	28 Sept.	No	20 –	Yes	No.
Henry George	27	B. I. Prison	20 May –	7 Oct.	Washerman	20 –	Yes	No.
Joseph Chater	36	Medway	16 March –	14 –	Nurse	21 –	Yes	Yes.
Samuel Lloyd	28	B. I. Prison	16 – –	15 –	- - Dispensary labourer.	21 –	Yes	Yes.
William Robins	25	Thames	13 October –	13 –	- Had fever eight weeks in "Thames."	29 –	Yes	Yes.
Thomas Riley	24	Medway	27 – –	21 –	No	29 –	No	No.
Thomas M'Dowall	28	B. I. Prison	8 June –	23 –	Nurse	30 –	Yes	Yes.
Daniel Hefferman	40	„	30 October –	30 –	No	31 –	Yes	Yes.
George Blinkworth	22	„	27 – –	27 –	No	1 Nov.	Yes	Yes.
John Tabner	26	„	1 November –	31 –	No	3 –	Yes	No.
William Green	23	„	18 October –	29 –	No	3 –	Yes	Yes.
John Eyres	34	Dromedary	25 August –	31 –	- - Cholera and dysentery.	4 –	No	No.
John Percival	48	B. I. Prison	31 October –	31 –	No	4 –	Yes	Yes.
William Muzzle	25	Medway	16 – –	16 –	Typhus	5 –	Yes	No.
Henry Chapel	30	„	Septemb. 1850	1 Nov.	- - Servant in hospital.	6 –	Yes	Yes.
William Williams	52	B. I. Prison	30 October 1853	29 Oct.	Diarrhœa	6 –	Yes	No.
Alfred Elder	31	„	1 November –	1 Nov.	No	6 –	Yes	Yes.
John Woods	26	Medway	25 October –	24 Oct.	No	7 –	Yes	Yes.
Daniel Tierney	34	„	3 November –	3 Nov.	No	9 –	Yes	Yes.
Richard Norman	67	B. I. Prison	31 October –	31 Oct.	No	9 –	No	No.
Thomas Payne	29	„	1 November –	1 Nov.	No	9 –	Yes	Yes.
John Willis	34	„	4 – –	4 –	No	10 –	Yes	Yes.
John Hogg	30	„	28 October –	6 –	Nurse	13 –	Yes	Yes.
Thomas Blood	26	Medway	11 March –	9 –	Boatman	13 –	Yes	Yes.
Richard Chadwick	33	„	3 November –	11 –	Ophthalmia	16 –	Yes	No.
James Buckley	28	B. I. Prison	16 – –	16 –	Carbuncle	17 –	Yes	No.
Henry James	27	Medway	31 October –	13 –	No	18 –	Yes	Yes.
William Braidwood	30	Dromedary	16 November –	15 –	No	21 –	Yes	No.
John Cave	40	„	28 September –	16 –	No	21 –	Yes	No.
George Hall	37	B. I. Prison	9 November –	8 –	No	22 –	Yes	Yes.
James Butler	34	Dromedary	10 – –	21 –	Diarrhœa	25 –	Yes	Yes.
Anthony Conroy	47	Medway	19 October –	20 Oct.	No	29 –	Yes	Yes.
Patrick Donelly	34	„	4 November –	5 Nov.	No	30 –	No	No.
Morris Darcy	41	„	18 – –	23 –	Obstipatio	30 –	No	No.
*Alfred Humphries	25	„	Septemb. 1851	2 Dec.	Bedmaker	9 Dec.	No	No.

* This being the last death from fever on board.

Received direct from			Whether employed in hospital as nurses, or labourer, or under treatment for other diseases; from		
	Medway	15		Medway	30
	Dromedary	3		Dromedary	10
	Boaz Island	17		Boaz Island	14
	Thames	1		Thames	1

Two Patients who recovered from Yellow Fever in the "Tenedos" Hospital Ship, with under-mentioned Symptoms, between the 1st September and the 15th October 1853.

NAME.	Age.	Where from.	When Entered.	When Attacked.	Whether in Hospital; employed as Nurse or Labourer; or under Treatment for other Disease.	Date of Convalescence.	Symptoms.	
							If Eyes and Body Yellow.	If Black Vomit.
John Jackson	24	Medway	1 September	1 Sept.	No	8 October	Yes	Yes.
John Hayes	32	„	28 –	28 –	Nurse	15 –	Yes	Yes.

To the Honourable the Commissioners of the Court of Inquiry,
&c. &c. &c.

(signed) *J. Hall*, M. D.,
Medical Superintendent.

No. 6.

Appendix.

Answers of S. Gorden Warner, Esq., M. D.

Answers of *S. Gorden Warner*, Esq., M.D., Surgeon, M.R.M.S.E.; in Medical charge of Convict Establishment at Boaz Island.

1. I have been nearly eight years in the medical department of the convict service at Bermuda.

2. I had much experience in yellow fever, which prevailed at Bermuda in 1843, having had medical charge of the Military Hospital, 20th regiment, at Hamilton, for more than two months; having attended the officers quartered there; having had many cases at Mount Langton Government House, including the Governor, Sir William Reid, and nearly every member of his family; and having also seen many cases when in private practice, and resident at Hamilton.

3. On the 5th of July.

4. At Boaz Island. The patient, a prisoner, was sent to the Tenedos Hospital I had no opportunity of knowing whether it was attended with black vomit. The case terminated fatally. I know, from the statement of one on whose word I can depend, that the body, after death, was nearly black, just as was the case at St. George's, when the fever was at its height, and to which place my informant was sent to act, as sick bay man, by order of late superintendent.

5. My practice was confined to attending on the families of the deputy superintendent and chaplain, and on several females and children at Boaz Island. All subaltern officers, as well as convicts, were sent to Tenedos Hospital.

After freely evacuating the stomach by an emetic, and the bowels by brisk purgatives, I considered the administration of calomel, so as to make the mouth sore, the anchor of hope. I found warm baths very useful. Deaphaetics, local depletion by cupping and blistering; mustard poultices; ice, and cold lotions to head, after having had the hair removed; general depletive I rarely used.

6. I think it is of local origin, produced by miasma arising from decayed animal and vegetable matter, generated by close, hot weather, succeeding to heavy rains, and continuance of southerly and easterly winds; by impure ventilation, and want of cleanliness in and about residences. I think it is wafted from place to place in the atmosphere, and I consider that certain conditions of the electric fluid in the atmosphere, not known, may have much to do with the origin of yellow fever.

7. I formerly thought the fever might be imported, but hostile to this opinion is the fact, that we have only occasional visitations of this scourge, while communication with St. Thomas's, Jamaica, and other places, where yellow fever almost always prevails, continually exists.

8. I think it is communicable. My experience, generally, confirms me in that opinion.

9. Where cases are crowded together, as in hospitals, &c. &c. &c.

10. My opinion is, that the fever was not imported. *See* Answer to Question, No. 6.

11. Yes.

12. I did not attend the troops in 1853.

13. Recent residence in a more temperate climate. Rigidity of fibre. Intemperance.

14. Unanswered.

15. Unanswered.

16. Unanswered.

17. Unanswered.

18. Unanswered.

19. The first case of fever, in 1843, is said to have occurred at St. George's, and its native population, generally speaking, has suffered far less than Europeans and transient residents.

20. Unanswered.

21. Unanswered.

22. The dietary of the convicts in health consists of, during the summer months, fresh meat generally; beef with vegetables four times a week, and salt meat and vegetables the remaining three days; bread, cocoa, tea, rice, sugar, &c.

Answers of S. Gorden Warner, Esq., M. D.

&c. &c. &c. In summer, a pound of beef is allowed four times a week; in winter, a pound and a quarter three times during the week. The convicts may be said to lead a regular life; they are worked eight hours a day all the year round. The cubic space allotted to each prisoner at Boaz Island is 317 ½ cube feet. All sick convicts are sent to hospital. The localities they occupy are St. George's (hulk), Ireland Isle (hulks), Boaz Island prisons.

23. I served at Boaz Island in 1853. *See* Answer to Question No. 22.

24. I cannot, from my own knowledge, answer any question regarding the hulk "Thames."

25. Fever of a typhoid type is occasionally endemic to Bermuda.

26. Probably certain conditions of the electric fluid; certainly extreme heat, southerly and easterly winds.

27. During the prevalence of fever in 1843 there was a deficiency of electric fluid in the atmosphere. Easterly wind prevailed, on the whole, more in 1843 than in 1853. In 1853 the wind was easterly and southerly.

28. The temperature was higher in 1853, particularly during the time the comet was visible, and more rain fell during the hot weather than is usually the case during the same season.

29. Generally speaking, robust constitutions, Europeans or Northerners, soldiers, sailors, and convicts.

30. The inhabitants of the colony are more exempt from yellow fever than Europeans; males, females, adults, and children are all equally liable to the disease.

White persons are more liable than coloured.

31. Yes, such is my opinion.

32. I do think so.

33. Cleanliness, drainage, non-exposure to the influence of the sun. Separation and dispersion of large bodies of men, as soldiers, convicts, &c. &c. &c.

34. Answer same as to question 33.

35. In 1843, as well as in 1853, the separation of the force did arrest the spread of the disease.

36. Probably because atmospheric agency, prevailing wind, heat, and moisture during the summer are not always the same; perhaps, also, cleanliness and ventilation have been more attended to during some summers, than during the hot months in other years.

37. I do not know the proportion of mortality amongst the natives compared with that amongst Europeans, but I am satisfied that the mortality is greater amongst Europeans.

38. I think the present inquiry calculated to elicit all information material to the subject, nor can I offer any further suggestion.

(signed) *S. Gorden Warner*, M. D., Surgeon,
12 January 1854. M.R.M.S.E.

No. 7.

Answers of Herbert Beck, Esq.

Answers of *Herbert Beck*, Esq., Assistant-Surgeon, Convict Establishment, *Bermuda.*

1. I have been for upwards of eight years in the public service in the convict establishment at Bermuda.

2. My experience of epidemic visitations has been confined to cholera, which occurred in the months of May, June, and July 1853.

3. The first case of yellow fever which came under my care, was on 20th July 1853.

4. The case previously alluded to, originated on board the Medway hulk; he was employed on the public works; he died on the 25th of the same month. I believe it was a well defined case of black vomit.*

5. My

---

* I have since ascertained that I was incorrect in stating that black vomit occurred.

Appendix.

Answers of Herbert Beck, Esq.

5. My duties were confined chiefly to attendance on the prisoners in the Camber, many of whom I treated in the early stage of the disease; I was frequently called on to attend cases of fever occurring amongst the military at Ireland Island.

6. My opinion as to the origin of yellow fever is, that it was caused by the diffusion of some latent poison in the atmosphere, aggravated by certain local causes, such as a long continuance of calm weather, with an unusual humidity of the air, and a high degree of temperature, these three states being highly favourable to the accumulation of malaria, and calculated to produce diseases of a low character, which was evidently the case in this epidemic, which was fully proved by the marked vital depression and the offensive and diseased condition of the secretions and excretions, and the early tendency to putrefaction.

7. My opinion given to the previous question is in no respect changed.

8. I am decidedly of opinion it is, and in support of that opinion, adduce the following cases:—

> 1st. That of a guard who previously enjoyed good health, was within a few hours subsequent to conveying a prisoner to hospital with fever, seized with it himself.
>
> 2d. One of a boat's crew, who were employed in carrying a fever patient into one of the decks of the "Tenedos" hospital ship, being attacked with fever in less than an hour afterwards. This man was in the enjoyment of robust health.
>
> 3d. The fact which is too well known of the majority of those attending fever cases falling under its influence.

9. I consider it communicable under any circumstances, but the most predisposing causes are the want of cleanliness and ventilation, overcrowding of the sick, and all other causes which tend to depress the vital powers.

10. I am decidedly opposed to the belief of importation, for if such was the case, how is it that it does not appear more frequently? as vessels from infected ports are constantly arriving here.

11. There can be no doubt that the malaria generated in certain localities, which give rise to zymotic diseases generally, may, under peculiar circumstances, as a moist and calm state of the air, and certain electric conditions of the atmosphere, want of cleanliness and ventilation, produce not only yellow fever, but others of a pestilential character.

12. Unanswered.
13. Unanswered.
14. Unanswered.
15. Unanswered.
16. Unanswered.
17. Unanswered.
18. Unanswered.
19. Unanswered.
20. Unanswered.
21. None that I am aware of.

22. The diet of the convicts is excellent, both with respect to quantity and quality; their occupations are more or less of a laborious nature; all cases requiring hospital treatment are at once removed from the hulks; every attention is paid to their sanitary condition, both on shore and on board; I am unable to describe the number of cubic feet each man enjoys.

23. Unanswered.
24. Unanswered.
25. Not that I am aware of.

26. I consider that a humid and calm state of the atmosphere, with a high degree of temperature, and the wind from the east and south, are most favourable to the spread of yellow fever.

27. I have not.

28. As far as I can ascertain, no important variation of temperature was observed between the summer months of 1852 and 1853; the weather certainly appeared more oppressive during the time the comet was seen, but that may be accounted

Appendix.

Answers of Herbert Beck, Esq.

accounted for by the continued calm condition of the weather, but considerable more rain fell in July 1853 than in the corresponding month of the previous year.

29. The class of persons most predisposed to fever are those recently arrived from Europe, of a sanguine temperament, and those of a shattered and enfeebled constitution.

30. It is well known that the colonists, as a general rule, are more exempt from fevers than Europeans, it is seldom that coloured persons have very severe attacks of fever.

31. I do not consider that yellow fever can be contracted by direct contact with an infected person, but that the effluvia given off from his body is capable of producing the same type of fever I have no doubt. After death, the disease can only be propagated by inoculation. I am of opinion that articles of dress and bedding used by fever patients can cause the disease.

32. That yellow fever may be produced by malaria arising from decayed animal and vegetable substances under peculiar states of the atmosphere, I entertain no doubt, but why yellow fever, more than typhus or any other putrid fever, it is difficult to say.

33. Cleanliness, ventilation, and drainage. I would suggest that fumigation with chlorine gas should be frequently employed in all out-houses and dwellings in the infected quarter. The vessels used for generating the gas should be placed in the lowest rooms. As the fumes of this gas are very powerful when produced by the ordinary method, and liable to cause much irritation of the air passages, I would recommend that a weak solution of chloride of lime, to which some muriatic acid should be added, be used; the gases evolved by this means, are as efficacious as those otherwise formed, and may be breathed mixed with the atmosphere with impunity. Particular attention should also be paid to removing all causes of humidity.

34. The measures I would recommend in case of a recurrence of yellow fever to arrest its speed, are the strict enforcement of the quarantine regulations, the prompt removal of all cases from the infected locality to some of the neighbouring uninhabited islands, under proper medical care, thorough cleansing and fumigation of all houses where cases had occurred.

35. From what I have heard, the separation of cases was attended by the most favourable results.

36. Before replying to this question, I would venture to make some remarks; that malaria caused by the decomposition of animal and vegetable matter are the chief sources of fevers generally, is a fact universally admitted; this being granted, an important question arises, which is, can the miasmeta evolved from the marshes in different localities in these islands under favourable states of the atmosphere (which have been stated in question 26), cause yellow fever, or any other of a putrid or pestilential character. I am of opinion they cannot, for if such was the case, how is it that every summer is not attended with such cases? And again, it is reasonable to suppose that the mortality amongst the residents in swampy districts would have been during the late epedemic very great.

The only reason I can assign for the exemption of Bermuda from yellow fever are, 1st. The great distance these islands are from all sources of fever, for if it cannot be proved that the disease was generated here, nor imported by individuals arriving from other countries, the only conclusion I can come to is, that it was introduced in the air from the coast of some neighbouring country. 2d. The vast expanse of ocean over which these malaria have to pass, which would cause their absorption more or less, as water has the power of doing so. 3d. The prevalence of strong winds, which must of necessity remove in a great measure all noxious gases.

37. I do not.

38. I cannot.

(signed) *Herbert Beck*,
Assistant-Surgeon,
Convict Establishment, Bermuda.

18 January 1854.

No. 8.

Appendix.

Answers of *W. H. Dickey*, Esq., "Tenedos."

Answers of W. H. Dickey, Esq.

1. I performed duty for the assistant-surgeon of the "Tenedos" hospital ship, during his absence for four weeks in the month of June last, and have been assistant-surgeon in the convict establishment since 1st September.

2. I have never before witnessed an epidemic visitation of yellow fever, but have seen numerous other epidemics, such as malignant cholera, scarlatina, smallpox, &c.

3. The first case of fever, during the late epidemic, which came under my observation, entered the "Tenedos" Hospital on 5th July.

4. That case was a convict labourer employed on the works at Boaz Island was taken ill there; entered the sick bay July 3d; was sent to hospital on the 5th and died on the 9th of same month. He had no black vomit, but presented all the other characteristic symptoms of the epidemic fever, and had a slight tinge of yellowness in the eyes.

5. I saw, and was in daily attendance upon, 470 cases of fever treated in the "Tenedos" hospital.

6. I consider it was entirely due to certain atmospheric conditions, operating upon and influenced by local causes, and thereby generating a peculiar morbific poison, which affecting those predisposed gave rise to the phenomena of yellow fever. Of the nature of these peculiar atmospheric conditions I can give no explanation; but the localizing causes are better ascertained; and among them may be mentioned effluvia of all kinds, whether emanating from the bodies of a number of persons crowded together in ill-ventilated apartments, or arising from animal or vegetable decomposition, marsh miasm, &c. As regards the nature of the late fever, I conceive it to be closely allied in its type, but not precisely the same as malignant forms of ordinary remittent. It was characterized by early prostration, loss of vital force, and tendency to decomposition of the animal fluids.

7. From what I had previously read on yellow fever, and the phenomena which I have witnessed in remittent, I cannot say that my opinion is at all changed from the one I entertained previous to the outbreak of the late epidemic.

I considered the first cases, as well as all subsequent ones, due to the causes I have pointed out. It was impossible, in the outset of the epidemic, to predict how far it would spread or what would be its malignancy; the latter went beyond the expectations of every one.

8. I do not think it is communicable, and have seen no instances which in my mind would prove its communicability.

9. I do not consider that it can, under any circumstances, become communicable. Where, owing to localizing causes, a concentration of the poison takes place, it may, from the number affected, appear to be communicable; but I conceive, if the sick and unaffected were together removed to a healthy locality, its spread would be arrested.

10. I think it was not imported.

11. I do not consider that a specific miasma, indigenous to a certain locality, can of itself give rise to yellow fever; but it may, when the peculiar atmospheric conditions necessary for the production of yellow fever are present, become one of the localizing causes, which will influence its spread and intensity.

12. Unanswered.
13. Unanswered.
14. Unanswered.
15. Unanswered.
16. Unanswered.
17. Unanswered.
18. Unanswered.
19. Unanswered.
20. Unanswered.

21. On board the "Tenedos" solution of chloride of zinc and chloride of lime were abundantly employed. The "Medway" hulk was removed from her

moorings in the Camber to Grassy Bay. With the movements concerning the "Thames" hulk I am unacquainted.

22. Weekly Diet: Fresh meat, 4 lbs.; salt pork, 1½ lbs.; soft bread, 7½ lbs.; buiscuit, 1 lb.; potatoes, 2 lbs.; rice, 12 oz.; cocoa, 1 lb. 5 oz.; tea, 1⅙ oz.; sugar, 10½ oz.; grog, ½ gill daily; cocoa mornings, and tea evenings.

The convicts are distributed in the hulks "Medway," "Dromedary," "Thames," and Boaz Island prisons. They are principally employed in quarrying stone, cutting and building. I do not know the exact amount of cubic space allotted to each man, but I believe it is more than is allowed to sailors on board a man-of-war. The largest proportional number were attacked in the "Medway," the least in the "Dromedary," while the greatest mortality was among the cases from Boaz Island, and the least from "Dromedary," as follows:

HULK.	TOTAL.	ATTACKED.	DIED.
Medway - - - -	560	143	14
Dromedary - - -	226	38	3
B. I. Prisons - - -	363	84	15

The "Dromedary" lay inside of the Camber, while the "Medway" was moored some distance from the shore in Grassy Bay.

23. Unanswered.

24. I am unacquainted with the hulk "Thames," except as regards her position, which I consider a very bad one in a sanitary point of view; not, however, likely to originate disease, but very favourable for its spread.

25. Bermuda can scarcely be said to have any endemic fever, but is subject to common bilious remittent of all tropical climates.

26. A long continued elevation of temperature, with frequent heavy falls of rain, and light easterly winds. Disturbance of electric equilibrium in the atmosphere has, I believe, much to do with the production of yellow fever.

27. I have none.

28. The temperature, I believe, was higher, and more rain fell than is usual.

29. The persons most predisposed are on the one hand those who are weakly and debilitated, and, on the other, the robust and plethoric: those who obtain the happy medium between these two conditions, neither too plethoric nor too weakly, will probably enjoy the greatest exemption.

30. The inhabitants of the colony are less predisposed than Europeans, and coloured persons are more exempt than any other class. I have no means of judging the comparative exemption of males and females, adults, and children.

31. I do not think it can be communicated in either of the ways mentioned.

32. I do not think emanations from decayed vegetable or animal substances will of themselves, under any circumstances, give rise to yellow fever; but, as I before stated with regard to specific miasmata, they will when the yellow fever atmosphere is present, become localizing causes.

33. General attention to cleanliness and ventilation; efficient drainage; whatever measures tend to neutralize or remove effluvia of all kinds, and attention to the disposal of large bodies of men, that they be not overcrowded and have sufficient ventilation.

34. Immediate removal from the infected locality; separation of force, as far as practicable; measures to facilitate prompt treatment of the sick; attention to fumigation, and a removal, as far as possible, of all localizing causes.

35. I cannot speak from personal observation of the result of separation of force, but believe it to be attended with good results, as it prevents the accumulation in one place of animal effluvia, which is one of the worst localizing causes

36. This is an extremely difficult question to answer. I can only suppose that the peculiar causes, which engender the condition of atmosphere necessary for the production of yellow fever, are seldom in operation. Perhaps from its geographical position Bermuda enjoys a greater exemption than islands which are situated farther south.

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Answers of W. H. Dickey, Esq.

37. I do not; but believe the mortality was much less among the natives.

38. I can offer no farther suggestions; but could furnish information with regard to the cases attacked and treated on board the "Tenedos," if it is desired.

"Tenedos." (signed) *W. H. Dickey.*

No. 9.

Answers of J. S. Hunter.

Answers of *Joseph Stewart Hunter*, M.D., Surgeon, "Thames."

1. Ten years in the army, and 20 in the convict service; the greater part of the period in Bermuda.

2. I have had the opportunity of treating the yellow fever in Bermuda, in the years 1819, 1843, and 1853.

3. On the 26th of August.

4. On board the convict hulk "Thames." This was a case of remittent fever, and terminated fatally, but unattended with black vomit.

5. I was surgeon of the "Thames" hulk, where every officer and the greater part of the prisoners were attacked with fever.

6. I am of opinion that it was imported.

7. I have had no reason to alter my opinion on this subject.

8. I think it may be communicated, not by contact, but by inhalation.

9. By inhaling the breath of a dying person.

10. I am of opinion that this fever was introduced into Ireland in vessels of war arriving at that part of the island as early as June.

11. I am of opinion that specific miasma, under special circumstances, may generate yellow fever.

12. Unanswered.

13. Unanswered.

14. Unanswered.

15. Unanswered.

16. Unanswered.

17. The soil of St. George's varies, part being a deep red earth with limestone bottom, while the greater part is composed of a light sandy loom, being particularly porous; the heaviest fall of rain being almost immediately absorbed.

The town of St. George's is situated to the south and west of the barracks, the forts being some distance removed from either; the drainage, which is by no means bad, being principally into the harbour. The lanes and back yards are frequently inspected by the Board of Health, and are kept as clean as circumstances would admit. Provision has of late been made by the parish, which cannot fail in improving the sanitary condition of the town. The extent and influence of the tides is highly beneficial, having a fall of between four and five feet, with outlets to the south, west, and east. The situation of the burying-ground was decidedly bad; it has recently been removed to some distance from the town. There are two slaughter-houses close on the harbour, and both kept remarkably clean. A few pigs are kept within the limits of the town, which the Board of Health are taking measures to have removed.

18. The night soil is generally thrown into the harbour, or buried in gardens or yards adjacent to the houses.

19. The yellow fever has visited these islands three times only as an epidemic during the last 34 years, and at no time has it been so generally fatal to natives as strangers.

20. Unanswered.

21. The corporation, as a board of health, frequently inspected the back lanes and yards. causing them to be kept as clean as circumstances would admit; these inspections were constantly resorted to after the appearance of the epidemic during the whole of the summer months.

22. The dietary of the convicts is good, consisting of a fair proportion of animal and vegetable food. The space allotted to each man is from 190 to 200 cubic feet. The sick of the hulks are treated in the convict hospital hulk "Tenedos," with the exception of the "Thames." The hulks were judiciously placed.

Answers of J. S. Hunter, M. D.

23. Answered in 23.

24. This hulk had been for many years placed on a bank in St. George's, within a few feet of the shore at the east end of the harbour, where ventilation at certain periods was most imperfect; the accumulation for many years of animal and vegetable matter in a state of decomposition surrounded and formed a bed for this hulk. These masses, partially exposed at low tides, and subject to the influence of a vertical sun, was in my opinion sufficient, from the malaria emitted, to generate disease.

25. No.

26. Calm weather with but little rain, close heavy atmosphere, wind east or south-east, are most favourable to the spread of yellow fever in Bermuda.

27. I believe there was but little variation in the state of the atmosphere in the years 1819–43, and 1853.

28. The temperature was not higher generally in 1853 than former years; in this year rain fell heavily during the hot months.

29. Persons of full habit, those labouring under chronic visceral disease, or of intemperate habits, were most predisposed to attacks of yellow fever.

30. The natives (white and coloured) are more exempt from yellow fever and other contagious diseases than Europeans or strangers.

31. I do not conceive it can be produced by contact with persons suffering from fever, or with the bodies of those having died from it.

32. I do.

33. Cleanliness, thorough ventilation, more particularly in the habitations of the lowly, a moderate quantity of vegetables, and the avoidance of all crowded assemblies.

34. The immediate change of locality, as far as practicable, in preference to all other precautionary measures.

35. I am perfectly cognizant of the fact.

36. The salubrity of the atmosphere, its situation in the Atlantic, and the sole use of tank water by its inhabitants.

37. About four per cent. in favour of the natives.

38. I should suggest the employment of native nurses, more particularly females, as they are but little liable to take the disease, and are tolerably experienced in its treatment.

(signed) *Joseph Stewart Hunter*, M.D.,
St. George's, April 1854. Surgeon, "Thames."

No. 10.

Answers of *E. Hilditch*, Esq., Deputy Medical Inspector.

Answers of E. Hilditch, Esq.

1. Twenty-eight years as a medical officer in Her Majesty's Navy, chiefly served in hot climates; seven years of this period on board ships on the Jamaica station, six years at the Naval Hospital at Jamaica, and six at Bermuda Hospital.

2. While thus serving I had frequent opportunities of seeing the fever of the West Indies prevailing epidemically on board. In 1841 the disease afflicted the garrison of Port Royal, Jamaica, to a frightful extent, and was exceedingly fatal. From 1840 to 1847 being employed at, and for the last three years of that period in charge of the Naval Hospital there, the cases under my observation and treatment were very numerous; vessels frequently coming in from sea with the epidemic on board, and sending their patients to the hospital.

3. On the 30th August 1853, Lieutenant Higgon, Royal Artillery.

4. At the Commissioner's House in Ireland Island, where he had been quartered ever since his arrival from England some months previously, occasionally visiting the other islands; had not however been at St. George's for about a month preceding the attack. On the day he was taken ill (27th August) he had got greatly heated in rowing. His was a protracted case, but he entirely recovered.

5. My practice was confined chiefly to the patients sent to the Naval Hospital, of whom 131 were received, and 39 of them died. Of the individuals to the number of 419 belonging to the Naval Yard, 29 were attacked by febrile

symptoms,

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Answers of E. Hilditch, Esq.

symptoms, but only seven proved to be cases of the epidemic, and they all recovered. There were five cases of the epidemic among 34 persons forming the families connected with the Naval Hospital, two of which five died.

6. I consider that it was identical with the epidemic fever of the West Indies, having its origin in some specific cause (the nature of which is at present unknown), affecting constitutions predisposed to its action, the presence of certain other conditions being necessary for the developement of the disease; those conditions I suppose to be heat, moisture, and animal and vegetable decomposition, and that where there is a still state of the atmosphere combined with these conditions, and a number of individuals are congregated together in close apartments, situated in undrained and uncleanly places, the specific cause will the more readily be called into action, and be proportionately destructive in its effect.

7. My opinion is not different from what it always has been on this subject.

8. In my previous experience I have seen great numbers at a time under treatment for a similar epidemic at Port Royal, and none of the attendants were then attacked, but in that now under consideration, eight out of ten individuals employed in the wards of the Naval Hospital suffered from the disease, and of these two died. All the medical officers were also attacked. The steward contracted the disease and died, but he had very little intercourse with the patients; his mother-in-law and brother-in-law, both natives, living in the same house with him, fell victims to the disease after his death; they were white; the last two are those noticed in the answer to No. 5, as having died.

9. I think it is possible, when an epidemic is prevailing, that in a warm, humid, and still atmosphere, such as prevailed at the time the above attendants were attacked, and where a large number of patients labouring under the malignant form of the disease are congregated together, such a state of the air may be produced as to give rise to an attack in persons thus exposed, who might without such an exposure have escaped, that is to say, had they been subjected to the ordinary epidemic influence only.

10. I am not in possession of any information to justify even a suspicion of its having been imported, neither do I think it probable that it was so. The same causes which are supposed to give rise to the disease in the West Indies (where it is considered endemic) exist here.

11. Yes.

12. The dietary of the troops can be better described by the military medical officers. I believe their mode of life to be such as usually appertains to soldiers in general. In Ireland Island there are less facilities for the abuse of spirituous liquors than exist elsewhere. With regard to the space allotted to each man in barracks, I can only speak of Ireland and Boaz Islands, in both of which they are a good deal crowded. In the lower rooms of the casemate barracks, somewhere about 280 cubic feet are allowed for each man; and in the upper 360; while in a cold climate it should never be less than 500, and in a hot one 750. Breathing an impure atmosphere as theirs necessarily must be, its deleterious effect will be heightened by the gases which, during the prevalence of certain winds, must arise from the common privy, and pervade the barracks. A man as soon as attacked was sent away from the barrack. There can be no doubt that immediate separation of the sick from the healthy is of the utmost consequence, and the removal of the troops from an infected locality should be insisted on. The good effect of this measure was shown by the removal of the military to the Ferry, Prospect, Bluck's Point, and Tucker's Island; a similar effect has been found in epidemics in other parts of the world. As to the localities, the troops in the Commissioner's house had only three cases, and the sappers escaped altogether; the airy situation of both their barracks may have contributed to this comparative immunity.

13. His mode of life, exposure to the vicissitudes of the weather, and his natural rest being interrupted, may render him the more susceptible. In most epidemics of this nature, the young and robust, those in the full vigour of life, are the chief sufferers, while those previously reduced by disease or other causes, either experience a mild attack, or escape altogether.

14. These observations apply generally.

15. The casemate barracks at Ireland are crowded, badly ventilated, and the health of the men likely to be seriously affected by the emanations from the privy.

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The only hospital at Ireland Island is the Naval, placed at an elevation of about 50 feet on limestone rock. It has four wards for men, each 50 feet long, 24½ wide, and 12½ high in the lower, and 10½ in upper wards, capable of holding together 72 patients; and there are four apartments (each to contain one) for sick officers. The site is the most eligible that could be procured. The ventilation is defective; the contaminated air of the wards not passing off readily, it is necessary to open windows which, by allowing a current of air to pass over a patient, is objectionable. The hospital is plentifully supplied with water from tanks under the building. The men have a water-closet, furnished with four seats, the soil being carried off into the sea through an iron pipe.

16. I have been in charge of the Naval Hospital at Ireland for the last six years.

17. Calcareous. Hard limestone, broken shells, and coralline formations being the chief part of the geological structure of the islands. The cultivable part of the islands is composed of marly soil. Marshes prevail to a considerable extent in the main island, arising partly from percolation of the sea, and partly by rain water being detained in hollows formed in the compact limestone. These marshes form a source of miasm, which is most probably injurious to the health of individuals exposed to its action. The islands I imagine to be of coral formation; the soil or ground to be produced by the action of heat and water upon salts of lime and decomposed vegetable and animal organizations. I am not sufficiently acquainted with the town of St. George to be able to give a full answer to the part of the question which applies to it, but as far as a cursory observation goes, it appears to be very badly situated with respect to purity of air, and it must receive a good deal of the detritus from the hills at the foot of which it is placed. The lower part of it is crowded full of narrow, crooked lanes, with a total absence of drainage, and an utter disregard to the cleanliness of the streets, &c. I believe the supply of water to the dwellings is very deficient. With regard to Ireland Island, the inhabitants, exclusive of the military, consisted at the commencement of the epidemic of 460, occupying 62 dwellings, scattered over the island, every dwelling giving to each person a space of 1,430 cubic feet to live in. The officers' houses have water-closets, the artificers' privies and cesspits, which are being abolished, and water-closets, with pipes to carry off the soil, substituted. There are no lanes on the island. Pigstyes and slaughter-houses are forbidden. Inspections of the houses are made from time to time, and all accumulations of dirt and rubbish prevented. Immediately under the hospital is a lagoon, into which the tide flows and ebbs; at a short distance from this lagoon is the burial ground. A very offensive smell has constantly in hot weather been complained of at the south end of the lagoon, to obviate which, various plans have been pursued, with only partial effect; but since the increase in the number of interments during the epidemic, the smell became of even a more offensive character, and this aggravation was thought possible to have arisen from the water entering the graves, and on the falling of the tide passing into the lagoon, charged with decomposing animal matter. Several of the men of the 56th regiment, who were posted near the lagoon, were attacked by the epidemic; but then so were others both on Ireland and Boaz, who had not been similarly exposed.

18. I am not aware how the night soil at Hamilton and St. George's is disposed of. I have seen only one privy at St. George's, and in that the soil was accumulated, and the stench from it insupportable. The effect on the health of persons living near must have been detrimental, and this would materially assist in the developement of epidemic disease.

19. St. George's has suffered at irregular periods from epidemic fever, in 1779–80, when it continued through the winter; in 1796, then commencing at the west end of the islands, and in 1812. In 1818 fever commenced at Ireland, extended to Somerset, did not reach St. George's that year, but in the following one a very fatal fever broke out in that town. In 1837 a fever prevailed at Ireland Island, but did not extend beyond it. In 1843 the fever first appeared at St. George's, about the 16th August; did not reach Ireland for a month, and was still longer in reaching the main land. In that year the mortality was about one in ten of the persons attacked. In all these visitations the native population appeared to have enjoyed a comparative immunity, very few having suffered in proportion to the other inhabitants.

20. At Ireland and Boaz Islands, 309 of the 56th regiment; artillery and sappers, about 110 in addition.

21. At the first intimation of the outbreak of the epidemic at St. George's, a house to house inspection was made by the naval storekeeper, deputy-inspector, and clerk of the works. The dwellings were in general found very clean. The number of persons inhabiting each was reduced, the ventilation was improved where considered necessary, privies and tanks cleared out, and chloride of zinc extensively used. With respect to the garrison, the numbers in barracks were reduced, a temporary barrack fitted up in the dock-yard, and 150 men drafted to Tucker's Island. Exposure of the men limited as much as possible; sentries nearly altogether withdrawn. The men when taken ill immediately conveyed to the hospital.

22.
23. Referred to the officers of the Convict Establishment.
24.

25. No.

26. A still state of the atmosphere, high temperature, humidity, and southerly winds.

27. From some minutes in my possession, these conditions appear to have been much the same in 1853 as in 1843.

28. The temperature in July, August, and September was of about the average height of those months; in October and November it was about five degrees above the average of four years. Nearly four times the usual quantity of rain fell in July, in August about the average, in September more than double; in October, always a very wet month, rather less than the average; in November and December considerably more than double. There was less electric fluid pervading the air, as shown by the occurrence of thunder and lightning, from July to November.

29. Unacclimated natives of northern climates, of full habit, and apparently of healthy constitution.

30. Not altogether exempt, but less susceptible. In general females and children are not so frequently attacked by yellow fever as adult males, but this does not appear to have been the case in the late epidemic. Whites more frequently attacked than the coloured, and the disease infinitely more fatal with the former.

31. That it certainly is not.

32. Yes.

33. The best means of prevention I conceive to be a strict attention to the general rules of maintaining health, including cleanliness, the breathing an uncontaminated atmosphere, the removal of known causes of disease. The avoidance of exposure to cold or excessive fatigue, and errors of diet. With respect to towns, the adoption of a proper system of sewerage and drainage, prevention of accumulation of soil, and decaying animal and vegetable substances. Removal of a burial-ground from the neighbourhood. The immediate removal of the sick from the healthy. Where troops are concerned, in addition to the above, immediate change of quarters to an uninfected district on the first appearance of the disease, giving them plenty of space for sleeping in, airing the bedding frequently.

In the summer months, where no disease is even suspected to exist, a portion of the troops should be placed in tents, or temporary barracks, to give more room.

34. Desertion of the affected district, and strict prevention of intercourse with it, in addition to measures recommended in Answer 33.

35. After the removal of the troops from St. George's to the Ferry, I believe the progress of the disease was nearly altogether stopped among them; it certainly was checked. At the time of the removal of the 150 men from Ireland, most malignant cases were daily coming into the Naval Hospital from the detachment there, and they continued to do so frequently up to the end of November, while only three cases occurred among those sent to Tucker's Island, and they were very slight.

36. The infrequency of the recurrence of this disease is not peculiar to Bermuda; the same phenomenon has been remarked at Gibraltar and Cadiz, situated nearly in the same latitude as Bermuda, and in other places in the south of Europe. Brazil had been upwards of 60 years free from it, when it re-appeared.

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re-appeared. At one period a similar immunity for a number of years was experienced in the West Indies. I am not aware that this feature has been satisfactorily accounted for.

37. I have no means of ascertaining.

38. I have no further suggestions to offer.

Are you of opinion that casemate barracks or forts are proper habitations for troops in this climate during the summer months?—Yes; provided they are properly ventilated, and that they are not too crowded. I refer to my answer to question No. 12, in which will be seen what cubic space each man should have allotted to him.

Are you of opinion that the confinement of prisoners on board hulks in the hot months is prejudicial to their healthy condition?—Yes.

(signed) *Edward Hilditch,*
Deputy Medical Inspector.

No. 11.

Answers by *S. S. D. Wells*, Assistant-Surgeon, Royal Naval Hospital, Ireland Island, Bermuda.

Answers of S. S. D. Wells.

1. I have been in Her Majesty's service eight years and eleven months, having entered the Royal navy as an assistant-surgeon on the 8th March 1845. During this time I have served 35 months in the West Indies (within the Tropics), three years and nine months at this hospital, and the remainder of the time at Halifax, *en route* to England to be paid off, on the home station, and in returning to this.

2. While an apprentice at this hospital I first saw the disease "yellow fever," during an epidemic fever in 1837. While serving in Her Majesty's ship "Persian," in the Gulf of Mexico, this disease appeared almost simultaneously on board every vessel then at the anchorage of Sacrificios; 27 cases, of whom two died, then came under my notice. The disease was considered epidemic, and was checked by the coming on of the "northers." While attached to the Naval Hospital at Jamaica, 105 cases came under my notice, but it is doubtful if these can be considered as an epidemic visitation, the patients having been received principally from ships which had cases on board on their arrival, and as the disease was not prevalent among the inhabitants of, or the troops stationed at, Port Royal.

3. The first case of the late epidemic, which came under my personal observation, was admitted into this hospital on the 28th August. It was a case of the disease in its mild form. The first case which came under my personal observation in the malignant form was admitted on the 12th September.

4. The case first mentioned I believe to have originated on Ireland Island. Of the patient's previous movements I am unable to speak authentically, having no authority to question his commanding officer, he being a private of the 56th regiment. This man recovered; he was nine days in hospital. The second case, also a private of the 56th regiment (Thomas Wilcock), stated on admission, that he believed the cause of his sickness to be over indulgence in spirits, and that the means of procuring this was obtained as pay for extra duty, whitewashing, cleansing, &c. barrack places at St. George's; it terminated fatally three days after admission, but was not a well-defined case of black vomit; for, although that fluid was found in the stomach after death, it was not ejected during life. The first "well-defined case of black vomit" was that of a corporal, 56th regiment (Matthew Dunne), who, I believe, contracted the disease at St. George's, whither, I have been informed, he was sent to stand a court martial. He was admitted from Hamilton on the 13th, and died on the 16th September.

5. During the whole time of the prevalence of the late epidemic, I was attached to the Naval Hospital only. The nature of my practice was to follow the directions, and carry out the views, of the head of the establishment. While performing this duty 129 cases came under my personal observation.

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This number may not perhaps agree with that given by other officers, but I have not included those cases which occurred during my illness, nor indeed any one which I did not personally attend.

6. My present opinion is, that "that epidemic fever" was of local origin. That there was an epidemic influence in the atmosphere, and that the disease was engendered in those situations which possessed to the greatest extent the necessary localizing influences.

Of its nature, I am of opinion that it was the "yellow fever" (so called) of the West Indies, that it was of a remittent type, and presented the forms of mild and malignant.

7. My opinion, as at present stated, does not in any way differ from that I entertained early in September, or indeed on the admission of the first case, on the 28th August.

8. I do not think it is communicable. The instances which have assisted in establishing that opinion are briefly as follows:—The first three malignant and fatal cases (Wilcock, Dunn, and Byrne), who had evidently contracted the disease at St. George's, and were sent to this hospital for treatment, had during their illness in attendance on them, by day or night, no less than 15 of the convalescent patients; none of these, and no attendant or medical officer suffered. The next malignant cases were from Hamilton (56th regiment), on the 24th and 25th September. Both these died, with black vomit, in about 72 hours from the time of admission. Seven convalescents attended on these; no one suffered. On the 29th September 33 cases, some presenting the most severe form of the disease, were received from St. George's. The hospital staff were busily employed with these men in the wards from 3 P.M. till 11 P.M. At the latter hour the night watches were arranged, of convalescents, nurses from the garrison on this island, and native nurses. My brother officer and myself spent the whole night in the wards. It was a close, damp, calm night, and the thermometer in the open air did not fall below 71°. The wards were exceedingly close and offensive, and the effluvia from the bodies of many of the patients, but more particucularly of one on whom we were in close attendance, was so sickening that we were obliged to relieve each other frequently, and to have chloride of zinc and aromatic vinegar freely sprinkled about to relieve the oppression thereby induced. I never, under any circumstances, was in wards which were so offensive; moreover the clothing brought by some of these men was in the ward all night under the cradles; from the limited staff at command, and the numerous calls on them, this was unavoidable.

Here, then, were causes of fomites and effluvia most offensive, and might have been expected to be loaded with the exciting cause of the disease, but that disease was not communicated to any one of that night's party. We had pure native blood, half native blood, and pure northern. My brother officer, too, was only a few weeks from England.

9. Under no circumstance, in my opinion, does the disease become communicable.

10. I am not of opinion that the fever was imported.

11. It is my opinion that a specific miasma, indigenous to a particular locality, &c. can, under special circumstances, produce yellow fever.

12. This question I am unable to answer, from never having done duty with troops, and being wholly without authentic data.

13. The exposure during the time he is on his post as a sentry, particularly at night, renders him liable to the effect of sudden chills, more especially in wet weather.

I think, also, that the large allowance of spirits, I believe two gills daily, has a bad effect on the general health of these men, as we know that spirits produce deleterious effects on the brain, stomach, liver, and kidneys, which were found to be the organs principally affected in my experience of the late epidemic.

14. For the same reasons as stated in Answer to No. 12, I am unable satisfactorily to reply to this question.

15. As to the localisation of the troops, *see* (A.) The Naval Hospital in Ireland Island, where the troops are accommodated when sick, is, I think, situated in the most eligible site which the island affords. It is a building of two storeys,

Appendix.

Answers of S. S. D. Wells.

storeys, and a basement surrounded by a verandah, which is open in the lower storey, and closed by jalousies in the upper. The basement is appropriated for store-rooms, and the upper portion divided into four wards. The two lower measure 49½ feet in length, 24½ in breadth, and 12½ in height; the upper are six inches wider and longer, and only 10½ feet in height. Each is estimated to hold, under ordinary circumstances, 18 patients; but I think 20 might be accommodated without encroaching on the minimum space between each bed, as directed by the Admiralty instructions. Excluding fractions, the lower wards will be found to afford to each man of 20, 758 cubic feet of space, and to each of 18, 842 feet. The upper, on the other hand, affording only 656 and 729 respectively. The ventilation of the building generally is defective, the more particularly to be noticed in hot, calm, damp nights, or in the winter months, when the windows cannot be opened without admitting currents of cold air directly on some of beds. The sewerage is well arranged, and the water supply abundant, and the quality good; with a moderate breeze a windmill pumps up salt water, and keeps up a constant stream through the water-closets, which are all fitted with pans, flaps, &c. The soil is conveyed through iron pipes into the sea, on the north side of the island. In calm weather fresh water is pumped by hand into the cisterns; and, under all circumstances, the drains are flushed at least twice every day. The want of a free current of water through the pond to the eastward is a defect, in a sanitary point of view, but that is in progress of being remedied. The theory of the water percolating the earth some 40 feet, entering the newly-made graves, and thence returning to the pond laden with noxious matter is, I consider, unsupported by experimental inquiry, for it is pretty generally known that earth and porous stone possess filtering and purifying powers, in a high degree, over water passing such a distance through them.

16. I was stationed on Ireland Island, as assistant-surgeon of the Naval Hospital, from 1st January to 31st December 1853 (inclusive). I have never been stationed at St. George's or Hamilton.

17. (A.) will give my views respecting the barracks, &c. on the island, though I am unable to procure complete, and entirely, and authentic data.

18. I am quite unable to answer this question authentically.

19. Ireland Island was visited by the epidemics of 1818, 1819, 1837, 1843, and in 1853. I have no means of affording any information as to the effects of the fever visitations on natives as compared with strangers. During the last epidemic I can only speak of such as were attached to the establishment, or admitted as patients into this hospital. Of the establishment during the epidemic, there were employed, and in the families of those employed, 13 persons northerners, and 39 native born (though some of these latter had one or both parents northerners); of the former eight were attacked, and three died; of the latter, 14 were attacked, and two died.

20. This I am unable to do.

21. I believe that means were adopted to cleanse the barracks, and precincts generally, on this island, early in September, as also all those portions of the islands under the control of the naval department. Shortly after, I believe that steps were taken to afford more accommodation for the men in the casemate barracks, by sending a party to Tucker's Island, and placing another portion in a building in the dockyard, but I am not aware of the dates when these movements were actually made.

22. This question I am unable to answer. As to the localities they occupy, as they affect their sanitary condition, my views are embodied in (A.)

23. With regard to the position which the "Thames" occupied at St. George's, I have always thought it (in a sanitary point of view) the worst that could have been selected in the harbour. The beach at the foot of the barrack hill has, on every occasion when I have visited it, been disgusting and offensive from refuse of all sorts there accumulated. This I presume to depend on the prevailing summer winds, S. to S.W., giving such a tendency to drift into this cul-de-sac, where the tidal current can have little influence in carrying it away. If the wind be to the eastward of S., it is exactly opposed to the ebb current. The same remarks hold good as to the refuse from the "Thames" herself. We have moreover in that position, independent of the heat of the direct rays of the sun, heat radiated and reflected from the neighbouring cliff; no winds can reach the spot from W. S.W. to N. N.E., which do not pass over the town, and to the

Answers of S. S. D. Wells.

eastward the cliff keeps off wind in that direction. A limited supply therefore of pure fresh air is afforded, and the ventilation must necessarily be imperfect.

24. I am not aware how long the "Thames" has been moored at St. George's, not having been in Bermuda when she was placed there. It is my opinion that her position is one likely to generate disease among those who live on board her.

25. No summer season has passed since I have been in Bermuda without cases of fever of various types being admitted into the Naval Hospital.

26, 27. Having stated in answer to Question 8, that I do not consider the disease communicable, and as I presume these questions, Nos. 26 and 27, apply to those who hold contagionist views, I shall pass them over, the term spreading being, in my opinion, inapplicable to my view of the nature of the disease.

28. By the table (*see* B.) it will be seen that the maximum temperature in the months of June, July, August, and September was higher than the average of the five preceding years; while the maximum for October was lower. The monthly range (except in September) was less than the average. The table appended is formed from a series of observations, made with the same instrument hung in the same place during the whole period. As to the fall of rain, I find from my own observations that it was less in the month of June than Captain Page's average, and less than that rated last year by Mr. Anderson. In July it was double the former, and more than treble the latter notations of the same month; in August about Captain Page's average, but less than half the fall of 1852. In September it nearly doubled the average, and far exceeded the fall of 1852. It usually fell in heavy and partial showers (*see* C.)

29. My experience of the disease has been too limited, and too much confined to practice among sailors and soldiers only, for me to have had an opportunity of maturing my opinion on this question, as to predisposition.

30. I believe the natives of the colony most generally suffer from yellow fever in its mild form, and as far as my experience goes (as stated in answer to Question 19), the attacks are numerically greater, and deaths with malignant symptoms more numerous among Europeans. Females I believe to be much more susceptible of the disease during the puerperal state, than males are at any time. Children also more susceptible than adults, and white than coloured persons of the same age and place of birth.

31. I am of opinion that the disease, as I witnessed it during the late epidemic, cannot be communicated by the direct contact stated in this question.

32. I think that yellow fever may be produced in Bermuda by the combined action on the human body of the effects of emanations from decayed and decaying vegetable and animal matter, and unfavourable states of the atmosphere.

33. Attention to personal and domestic cleanliness, removal of all substances which vitiate the surrounding atmosphere, ventilation of houses, free and effectual, and more particularly of basements and cellars, with great attention to the drainage of these latter; effectual sewerage arrangements, by which the night soil, &c. be removed; in short, I would suggest peremptory measures to enforce general sanitary reform.

34. The remarks appended to Questions 26 and 27, apply with equal force to this one.

35. It is not known to me.

36. Because the all-wise Disposer of events so wills it.

37. I do not.

38. I have added certain appendices applying to Questions 15, 17, and 22, also to 28.

As to suggestions, I shall respectfully lay some before you, and with reference to them, as also to the opinions which I have expressed, I may add that I do so with all deference to men who have had more experience, and more extensive fields of observation, than have fallen to my lot. My reasonings may be illogical, my deductions incorrectly drawn, or my mode of investigation faulty, and from limited experience my observations less accurate than they might be; but having been thus called upon to answer this series of questions, I have endeavoured to do so to the best of my ability, and conscientiously believing my statements to be correct.

I would suggest that localities be particularly studied, and the date of appearance of the disease, and the rates of mortality in these compared with the same data during former epidemics. That this inquiry should not only be made relative to those buildings and ships which are under the control of Government, but also every house in the towns, or in the country where a case of fever has been known to exist. That the state of the drainage around, the condition of the basement, whether cellars or otherwise, as to drainage or ventilation, the state of the joists and flooring, the circumstances of the occupants, as to personal and domestic cleanliness, and provision for food and clothing; if any attention is paid to ventilation, the arrangement of sewerage, if any, the supply and quality of the water, and the business or trade of the occupants. Under the head of ventilation would come the cubical space allotted to each person while sleeping at night; and in the poorer tenements, the drainage as applied to cellars would include whether these were wholly, partially, or not at all floored.

There have been many isolated cases of the disease during this late, and I believe during former epidemics, and it would be valuable to know if any preference to certain localities can be traced.

(A.)

Since the appearance of the late epidemic among us, I have heard much discussion on the question of "importation" of the disease, and have heard many persons confidently state "that yellow fever never had its origin in Bermuda at any time, but was always imported." I well remember the opinion of the late Dr. Kennedy, who was surgeon of this hospital in 1837, as to the origin of the fever that prevailed epidemically in that year, and gave it in opposition to such statements. The treacherous memory of youth was said to render my testimony invalid, and I was therefore led to search the records of the hospital to find any facts or documents which could set me right, and confirm either opinion; while so doing, I was struck with what appears to be a great contrast in the healthiness of certain localities in this island, as compared with others. I give the results of my inquiry, though imperfect, being unable in my subordinate position to obtain authentic information from the different departments. As to the question of importation, it is stated that the fever was brought in her Majesty's ship "Seringapatam" from Havanna, and that no case of the disease existed on Ireland Island, or in Bermuda, until after that ship arrived.

I find, however, that of 26 patients remaining in hospital on the 30th September 1837, three were cases of fever, and had been admitted as follows: one a convict from the "Dromedary" on the 19th September, one a boy from the naval yard on the 29th September, and one a boy from the "Royal Oak," also on the 29th September. On the 1st October a case from a merchant brig, the "Margaret." The position of these vessels in the Camber at the yard must be now noted; the "Dromedary" occupied her present position, the "Royal Oak" that lately occupied by the "Weymouth," alongside the dockyard, and the "Margaret" ahead of the "Royal Oak," and between that ship and the "Dromedary." The four cases already mentioned were mild, and all recovered.

The "Seringapatam" arrived on Thursday, the 5th of October, from Havanna, in a passage of 30 days, and anchored in Grassy Bay. In the Royal Gazette of the 10th October 1837, it is stated "The 'Seringapatam' has no fever on board, and is in a particularly healthy state, having only two cases on the surgeon's list, and those resulting from accident." Her Majesty's ship "Pearl" arrived from Portsmouth direct, on the 6th October, and requiring refitting, hauled inside the Camber, and the crew turned over to the "Royal Oak." Fever appeared among them, and the first case from this ship's company was admitted on 15th October; between the 1st October and this date, there had been admitted from the 30th Regiment two, from the "Dromedary" three, from the Naval Yard one, and from the "Margaret" one. On the 19th October, in a letter of that date, Dr. Kennedy recommends the removal of the "Dromedary," and in another of the same date to Captain Leith of the Seringapatam, senior officer present, he recommends the removal of ships of war to as great a distance from the shore as possible, and to hold as little communication with it as consistent with carrying out the duties; he also recommended the removal of the "Pearl's" crew to Port's Island, which was done at once. In a letter of the 28th October, the removal of a portion of the "Coromandel's" convicts was recommended, and a thorough cleansing and ventilation of her lower decks, as it was found the ship could not be moved under a week's preparation. In his report to the director-general, Dr. Kennedy not only states that the fever first appeared in the "Dromedary," but that it there first showed its malignant character.

Appendix.

Answers of S. S. D. Wells.

The following Table, showing the date of the first case admitted into hospital from the different sources, and rates of the mortality, will be found useful for future comparison:

Whence, and Date of 1st Case.	Ratio of Mortality.	Whence, and Date of 1st Case.	Ratio of Mortality.
Dromedary, 1st case, 19 Sept.	1 in 4·4.	Weymouth	2 cases; no death.
Coromandel, 1st case, 16 Oct.	1 in 10.	Margaret, 1st case, 1 Oct.	5 cases; no death.
Coromandel, 2d case, 27 Oct.	—	30th Regiment (1st Company) 1st case, 11 Oct.	1 in 9.
Pearl, 1st case, 15 Oct No deaths of cases sent from Port's Island	1 in 11.	Sappers, 1st case, fatal one 23 October.	1 in 3·5.
Naval Yard, 1st case, 28 Sept.	1 in 6.	Engineer Department	1 case; no death.
Royal Oak, 1st case, 29 Sept.	No death of two cases.	Artillery, 1st case, 17 Oct.	2 cases; no death.
		Seringapatam, 1st case, 23 Oct.	1 in 6.
		Cornwallis, 1st case, 30 Oct.	1 of 2 admitted died.
		—	

Thus it will be seen that the disease appeared to develope itself earliest, and in greatest intensity, around the locality of the "Dromedary." The "Coromandel" suffered little, sending only 10 cases, while the former sent 44; and the "Pearl's" crew, who arrived after the "Seringapatam," and direct from England, but were exposed to the influence of this locality, sent at an early date so many cases, 34. The company of 30th regiment occupied the barracks where the sappers now are, the barracks which the sappers then occupied having been since pulled down. The artillery were in their present quarters. The artillery sent two patients, the 30th regiment nine, and the sappers seven; the casemate barracks were not then finished.

This Table applies to the Epidemic of 1843.

Whence, and Date of 1st Case.	Number of Cases Admitted.	Ratio of Mortality.	Whence and Date of 1st Case.	Number of Cases Admitted.	Ratio of Mortality.
Dromedary, 21 July	163	1 in 7·8.	Thunder, 15 August	28	no death.
Coromandel, 25 August	223	1 in 10·6.	Lark, 25 August	10	no death.
Naval Yard, 7 August	46	1 in 9·2.	Tenedos, 10 August	269	1 in 13·4.
Sappers, 21 August	22	no death.	Weymouth	2	no death.
Royal Artillery, 9 August	19	1 in 4·75.	Antelope (St. George's), 31 July	108	1 in 5·4.
20th Regiment, 5 July	131	1 in 11·9.	—		
Naval Hospital, 13 August	12	no death.	Magnet, } Merchant Vessels at Dock Yard	1	no death.
Barrack Serjeant, 13 August	1	no death.	Forager,	2	no death.
Engineer Department, Oct.	1	died.	Ireland Island (Servants)	2	no death.

The "Dromedary" sent 32 cases, of whom five died; and the 20th regiment (casemate barracks) 36 cases, of whom three died in July and August, while the "Tenedos" sent only 11, and the "Coromandel" 1 in that time, showing the priority of attack in "Dromedary" and casemate barracks. The ratio of mortality shows the disease to have been more fatal in "Dromedary" than in "Tenedos" or "Coromandel." They occupied the same places as in 1837, except "Tenedos," which was not here in 1837. I was not in Bermuda in 1843, but have collected the above as authentically as I possibly could.

This Table applies to the Epidemic of 1853.

Whence, and Date of 1st Case.	Number of Cases Admitted.	Ratio of Mortality.	Whence, and Date of 1st Case.	Number of Cases Admitted.	Ratio of Mortality.
56th Regiment, Ireland Island, and Boaz Island, 28 August.	62	1 in 274.	Royal Artillery	7	1 in 7.
Sappers, 11 September	4	no death.	Naval Yard	2	no death.
Royal Engineers	1	no death.	Naval Hospital	11	1 in 5·5.

This table does not include any patient supposed to have contracted the disease in other localities than Ireland and Boaz Islands.

It

Appendix.

Answers of S. S. D. Wells.

It would be very interesting to note the state of health of convicts of the "Medway," and the date when fever appeared in her, as she has lately occupied the position which, from the experience of the past with the "Dromedary," has appeared the most unhealthy. The effect of the change of position in the "Dromedary," she having occupied the "Coromandel's" old place, would also be interesting. The state of health of the dock-yard people, among whom no death occurred, is, I consider, due to the great improvement in their sanitary condition since 1843. I do not myself see any ground for supposing the disease to have been brought from St. George's to Ireland either in 1843 or 1853, as it appears to me to have been generated simultaneously in both localities, but that it first assumed malignant character at St. George's. The inquiry as to the healthiness of the locality near the "Dromedary," and the casemate barracks, with its present sewerage arrangements, are, I think, worthy the attention of those who can command correct data of all the facts *pro* and *con*.

As a future position for the "Thames," I would suggest that Hen Island, in St. George's Harbour, be purchased by the department, as there appears to be plenty of water on the S. W. side, so that she might be moored, afloat, close to the shore. The island would afford space for the men to wash and dry their clothes when not employed on the works; and were it deemed necessary, room could be found to build accommodation for a military guard. All refuse would be readily carried away by the tide, which runs freely round the island. I cannot estimate the expense, but with such a mortality as occurred in the "Antelope" in 1843, and in the "Thames" of late, I cannot suppose it could be called in question.

(B.)

Average of Five Years.	6. A.M.		Noon.		6 P.M.			6 A.M.		Noon.		6 P.M.	
In the month of	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.		Highest.	Lowest.	Highest	Lowest.	Highest.	Lowest.
June	79·12	68·25	83·12	68·25	80· 1	66·37	1853.	80	70	84	74	80	71
July	81·62	74·	85·5	76·	82·75	74·75		80	76	86	79	82	76
August	81·75	74·75	86·75	74·	82·37	73·12		82	75	87	77	83	75
September	80·62	72·75	84·75	72·87	81·	72·12		80	71	87	70	82	69
October	77·62	66·62	81·87	69·75	77·87	66·12		76	67	80	70	76	68

(C.)

Comparison of Falls of Rain.

MONTHS.	Captain Page's Average.	Mr. Anderson's Register, 1852.	My own Observations, 1853.
	Inches.	*Inches.*	*Inches.*
June	5·34	4·01	3·37
July	4·65	2·67	9·52
August	3·37	7·00	3·26
September	3·93	4·91	7·49

30 January 1854. *Samuel S. D. Wells.*

Answers of Assistant Surgeon Lilburne, R. N.

No. 12.

Answers of Assistant Surgeon *Lilburne*, R. N.

1. Over seven years in the Royal Navy. I have served in the Mediterranean, North America, and West India stations.

2. At Port Royal Hospital, Jamaica, during the time of the fever on board Her Majesty's ship "Pantaloon," in 1847, and that of Her Majesty's S. S. "Vixen," in 1848.

3. On the 14th July 1853.

4. This case occurred in a man belonging to the Royal Artillery, who was employed as a baker in the commissariat bakery at the dockyard. He arrived from St. George's about the 9th June, to be so employed, and was sent to the Royal Naval Hospital on the 14th July with dysenteric symptoms, but which merged into those of fever, of which he died on the 22d July. There was no irritability of stomach in this case, and therefore no vomiting.

5. At the commencement of the epidemic I was employed at the Royal Naval Hospital and dockyard at Ireland Island, afterwards attending the dockyard people and troops stationed here. About the middle of September I was sent to St. George's, but was afterwards ordered back to the island, when I was again placed in charge of the dockyard and troops. I continued there until the 2d November, when I was ordered to the Royal Naval Hospital, where I still remain.

6. I believe it arose from a peculiar state of the atmosphere, (with the nature of which state I am at present unacquainted); but this acting on animal and vegetable matter in a state of decomposition, caused the exhalation of a morbific poison, which affected the systems of those who were susceptible of the disease.

7. No.

8. No; but I believe that by collecting a large number of fever cases in the same locality, that the surrounding atmosphere becomes so impregnated with the emanations from the bodies of those suffering from the disease, and that the attendants, such as medical officers, &c., breathing the air thus deteriorated, are rendered more susceptible of the disease than those breathing a purer atmosphere.

9 and 10. Unanswered.

11. Yes.

12 to 14. Unanswered.

15. The site, accommodation, and conveniences of the Royal Naval Hospital at Ireland Island are good, but the ventilation is very indifferent.

16. At St. George's, on the 18th and 19th September; during the rest of the epidemic at Ireland Island.

17 to 20. Unanswered.

21. Having had occasion to call the attention of the deputy medical inspector of this establishment to a filthy smell emanating from a tank in one of the houses belonging to the dockyard, and in which I had a patient labouring under fever, induced, I have no doubt, by this effluvium. A general inspection was the consequence of this, when tanks were cleared out, pigsties removed, sewers flushed; in fact, a thorough cleansing took place all over the island, at least all that belonging to the naval department. This took place about the first week in September.

22 to 24. Unanswered.

25. During the period of nearly three years that I have been stationed at Ireland Island fever of an ephemeral character has appeared to a greater or less extent every year.

26. A humid state of the atmosphere, with a high temperature, and easterly winds.

27. No.

28 to 30. Unanswered.

31. No.

32. Yes.

33. Thorough ventilation and perfect cleanliness are the best preventives.

34. Separation of the cases, and the removal of every soul from the locality where

Answers of Assistant Surgeon Lilbourne, R. N.

where the disease first makes its appearance; should it continue to spread after this, again separate and remove.

35 to 37. Unanswered.

38. No.

R. N. Hospital,
Ireland Island, Bermuda,
22 January 1854.

James Lilburne,
Assistant Surgeon, R. N.

No. 13.

ANSWERS of Surgeon *Parratt*, Ordnance Medical Department.

Answers of Surgeon Parratt.

1. I HAVE been nearly 24 years in the Ordnance Medical Department. I have served for a short period in the West Indies, also in Canada, China, and Great Britain.

2. I witnessed one epidemic visitation in Hong Kong, and was present at two irruptions of Asiatic cholera in Canada and England.

3. The first case came under my personal observation about the 6th November last.

4. The case originated at Hamilton; the patient was a private of the 56th regiment, employed as cook for 12 men, and resided in the barracks there; I attributed the cause of the attack to the influence of a very offensive privy, with imperfect drain. The case ended fatally in four days, and was attended by well defined black vomit. The drain has since been replaced by a new one of larger dimensions, and circular.

5. The day after visiting the above case, 7th November, I was myself taken ill with fever; and having only arrived in the colony on the 2d November, and returned to duty on the 1st January, I have had no opportunity of practice.

6. That the disease was nothing more than an endemic originating in these islands, aggravated by a particularly hot summer, and some other occult causes combined, the same most likely as have existed lately in the Southern States of America and the West India Islands, and causing so fatal an epidemic to prevail in those countries, but of the nature of which influence so little is known at present. I am of opinion that the nature of the late epidemic, from the little opportunity I have had of judging, partook of that of yellow fever, varying, however, much in its type and nature, and modified by age, temperament, habits (country born), locality, and temperature of the atmosphere.

7. No, I think it is not different to my opinion generally formed, so far as I can judge from the information obtained.

8. My opinion is, that yellow fever is communicable; and I have arrived at that conclusion from the number of medical officers, jurors, hospital serjeants, convict guards, and attendants, who have been reported to have either died or suffered severely from the late epidemic; also the surgical cases which have either been in the same hospital, or near to it, which have taken the disease. In the Ordnance Hospital alone six orderlies and two hospital stewards died of the disease, viz.:

Stewards and Orderlies.	Convict Guards Died.	Jurors Died.
Serjeant Wm. Shand, R. A.,	Mr. Gray.	Mr. Cusack.
Corporal W. M'Birney, R. A.,	Mr. Campble.	Mr. Rowlandson.
Gunner J. Robson, R. A.,	Mr. Wilson.	
Gunner B. Moger, R. A.,	Mr. Virtue.	Mr. Cusack's wife and two children died of the disease.
Gunner R. Keast, R. A.,	Mr. Bird.	
Gunner J. Kennedy, R. A.,	Mr. Phillips.	
Gunner D. Alexander, R. A.,	Mr. Underwood.	
died from the effects of yellow fever.	Mr. Taylor.	

Answers of Surgeon Parratt.

In addition to these, Mr. Moore, hospital steward, died at the Naval Hospital and others; 56th regiment, one hospital serjeant died; two were dangerously ill; and Dr. Deeble states between 20 and 30 orderlies, and numerous officers' servants, who attended on their masters, amounting to 16. Gunner Thomas Goodwright, admitted into hospital with a wound of his throat, at St. George's, and Gunner Nesbitt, with venereal disease, at Port's Island, both died of fever, although placed in tents near the hospital; also a case of chronic ophthalmia of the 56th; some I believe also occurred in the Naval Hospital.

9. My impression is, that yellow fever becomes communicable when it assumes a malignant, low character, in ill-ventilated abodes, or crowded hospitals or hulks, especially when the medical officers, attendants, and relatives are Europeans, and worn out with fatigue and mental anxiety, which I believe to be the reason so many of them have fallen victims to the disease.

10. I am of opinion, so far as I can judge, that it was not imported; but this interesting point required to be thoroughly sifted, and the matter set at rest.

11. I believe that sporadic cases of yellow fever occur here more or less in ordinary seasons, at least so I have been informed. I know of one case which is recorded to have occurred in the Ordnance Hospital, in the month of December 1852; another case on the 25th January 1853, reported by Dr. Deeble. *Vide* also the tablets in the churches.

12. The ration consists of one pound of bread and one pound of fresh meat or salt pork per day, Mondays and Thursdays being the days salt pork is issued. The undermentioned are the cubic spaces per man of each barracks in St. George's, viz., Royal Barracks, 393·0; Sappers' Barracks, 417·0; Fort Victoria, 350·0; Hospital (56th regiment) 545·0. The sick are accommodated in hospital, except those amongst the women and children. No effective system of separation is carried out amongst the latter. The troops are distributed to St. George's, Hamilton, and Ireland Island. The sanitary condition of St. George's admits of great improvements. There should be a military hospital at Ireland, and barracks and hospital in or near Hamilton.

13. I think the soldier is particularly prone to attacks of fever, from his indulgence in spirituous liquors, and his European origin; his dress is also little adapted for the summer months. I also think, with the excellent ration of animal food, a very much larger proportion of vegetables should be obtained, especially in the summer, when the system becomes unduly stimulated by this omission, and thirst, &c. consequently induced. Pickles in barrels might be brought from the United States at a very small price.

14. The force of the epidemic seems to have expended itself chiefly on the troops at St. George's; but I can only judge by the statement of others, as I have had no experience or familiarity with one place more than another. The ready access the soldier has to spirits, compared with that of Ireland Island, is known to all, and the comparative drunkenness consequently much less at one place than the other in each branch of the service.

15. The absence of effective police regulations; the want of cleanliness, order, and sobriety in St. George's, and the intermixture of the soldiers and their wives and families amongst the inhabitants, in over-crowded, ill-ventilated abodes, where their husbands reside with them, must tend to foster disease of mind and body, and bring fevers and infectious diseases amongst the troops, or *vice versâ*. There is one good hospital close to the sea shore, on the northern side of the land, directly behind the barracks, calculated to hold 50 men, and the Ordnance Hospital, very inconveniently situated a mile from the barracks, on the road towards Hamilton. It is wooden and illegible, from its structure, site, and only capable of holding 16 men. One great disadvantage the Ordnance Hospital has, is that the deceased soldier is brought through the town of St. George's to the burial-ground on the eastern side. This occurred during the epidemic. On Ireland Island the Naval Hospital is an admirable establishment, capable of holding 80 men, conducted on a liberal scale, but much too far off for military purposes, even for the troops stationed on Ireland Island. It has, however, proved of advantage during the late epidemic, notwithstanding the great inconvenience, danger, and suffering to which the sick soldier was exposed in getting there.

16. I have only been in St. George's since the 1st January. *Vide* explanation afforded in No. 6.

Answers of Surgeon Parrott.

17. The soil appears chiefly sand. The town of St. George's is situated within an amphitheatre of low hills, and opened completely to the south. A little beyond the eastern side, on a ridge, is the barracks, and around are the forts. The principal burial-ground is in the centre of the town. There are two slaughter-houses in the town, which should be removed. I see some pigs kept, and many ruinous buildings and ill-cultivated gardens. For further particulars *see* No. 15. All these circumstances tend to engender fever.

18. In both places the soil is disposed of the same way, viz., at long periods, by digging deep holes in the garden, &c., where the soil is deposited. Generally there are no cesspools, or ash-pits, or drain of any kind. I never witnessed a place where the absence of these preventives against disease were so manifest as at St. George's. The only way I can account for it is, that the corporation are entirely without funds, and look, therefore, to the Government for assistance. Hamilton seems in a fair way to become, in time, just as bad, as the system of drainage is the same in both places; although Hamilton, being modern, has wider streets, and funds.

19. I believe St. George's has always suffered severely from epidemic diseases. I have been stationed at no other post. *See* No. 6.

20. This will be better described by those who were in Bermuda when the disease broke out.

21. These means will be better described by those by whom they were adopted, and were on the island at the time of the outbreak of the epidemic.

22 and 23. Unanswered.

24. Some years. Her position could scarcely be worse, being directly under a nearly perpendicular bank, nearly 130 feet high, where the inmates would be deprived of a free circulation of air, being of southerly aspect, exposed to great heat. I can easily conceive disease when once on board becoming fostered, and the miasm conveyed by the wind to the barracks to leeward, directly above; but also by means of the dead bodies conveyed across the end of the barracks to the convict burial-ground, and by the guards sent into the town as already alluded to.

25. I believe that bilious remittent fever is endemical to Bermuda, which is only a mild term for yellow fever in my opinion.

26. A damp warm wind from the east and south-east, and the temperature above 70° Fahrenheit.

27. Yes, and it seems to have been the case in 1843.

28. The summer was more than usually warm, and more rain fell, I believe, in the spring.

29. Those of a plethoric habit, and Europeans lately from their native climate.

30. They are. I believe females are generally more exempt than males from yellow fever, adults than children, and coloured than white persons.

31. I believe yellow fever is communicated not so much by direct contact as by inhaling the miasm conveyed from the patient's body, either alive or soon after death. It is probable that such may be (in very malignant cases) conveyed to others by means of the clothing; but my experience does not enable me to speak positively on this subject.

32. I am decidedly of this opinion.

33. Sound moral and religious habits, conducing to industry, temperance, &c. Spacious houses, drainage, and cultivation of the land; police regulations, enjoining the sweeping of the streets, removing of nuisances, and checking ill-conducted houses of entertainment, the sale of wholesome malt liquors at a moderate price, &c. &c. *See* No. 34.

34. The immediate removal of the healthy from the sick and the infected locality; but as prevention is better than cure, as each warm season commences, an epidemic should not be waited for, but a part of the men may be, with much propriety, encamped near their barracks, or at a convenient distance from the same.

35. The result appears to have been salutary, so far as the healthy were concerned. Those, however, who were present and witnessed the results are better able to offer an explanation than myself.

36. Because it only comes as an epidemic in very unfavourable seasons, when fevers become pestilential.

37. Unanswered.

Appendix.

Answers of Surgeon Parratt.

38. I beg most strongly to suggest that the tax may be entirely taken off porter and wine, and great discretion used in granting licences to publicans; for evident reasons also the public-houses should not be closed until tattoo, and that an undue exportation of potatoes be checked, which are rendered scarce by their being sent off the island; also that persons should be encouraged to bring into cultivation the large tracts of waste lands, so that not only could ships' crews be supplied with vegetables at a cheap rate, but the troops also. That the hospitals should be supplied by native orderlies from an organised corps of blacks, either raised in this colony or the West Indies. These men, feeling they had a claim on the Government, would cheerfully perform duties on emergencies, such as have occurred in the late epidemic.

I would further suggest that proper accommodation should be provided in each military hospital for sick officers, many of whose lives might, I think, have been saved if such had been at hand during the late epidemic. So convinced was I of the advantage afforded by such an arrangement, that directly I became ill I requested to be taken to the Naval Hospital (as there was no military hospital available), where, under the superintendence of Dr. Hilditch, I experienced every kindness and attention that skill and humanity could dictate.

That the troops should have the same advantage that a similar rank in life now have in England, viz., baths and wash-houses, and the married people be accommodated with huts or cottages, erected by the Government, in the vicinity of the barracks, and let at a small remunerative rent, with a small portion of land attached to each, in order that the soldier may not only raise vegetables for his own consumption, but also for that of the rest of his corps and officers, thereby rendering them independent of the scanty supplies now supplied by the inhabitants of these little cultivated, but otherwise fertile as well as beautiful islands; and also prevent their being lodged in all sorts of low and unhealthy places in the towns, where they are liable to contract disease and bring it into barracks, as well as communicate it to the inhabitants. The officers in visiting their men so located are unnecessarily exposed to fatigue and infectious disease, which this arrangement would effectually provide against, and their surveillance over the married soldier would become effective, instead of being, as it now is, a mere mockery. I would also observe, that the duties should be so arranged as to afford the soldier time to cultivate his garden, which, if neglected, should be given to those who are more industrious. I need scarcely add, that much useful time is consumed by the nature and character of the present dress of the British soldier, which might be rendered much more simple and less expensive; for instance, a flannel fatigue jacket to come well over the loins, which could be washed, and material of texture for trousers, coloured (if preferred, as in the French army). The cap should be covered with white cotton; and his shoes a part of the year made of canvas.

Cooling beverages, such as lemonade, ginger beer, &c., should be supplied to the men on guard especially, and every means tried to keep them from indulging in spirituous liquors, which is the very bane of this colony. Skittle-grounds might be made in the ditches of the forts with a temporary covering; and ball courts not only made, but kept in repair.

(signed) *J. W. Parratt*, Surgeon, "O. M. D.,"
Principal Medical Officer.

No. 14.

Answers of *J. H. Ker Innes*, Esq., Surgeon, 56th Regiment.

Answers of J. H. Ker Innes, Esq.

1 and 2. In answer to the first two questions I have to state that, for the past 12 years, my duties as medical officer to Her Majesty's forces have carried me to India, to Sindh, and the shores of the Persian Gulf, and that during this period I have also been quartered in England, Ireland, and Scotland. Abroad I have witnessed several attacks of epidemic cholera, as well as a fearful epidemic in the 78th Highlanders in upper Sindh, 765 souls in this regiment having perished from remittent fever and dysentery in the course of three months; and in Ireland I had also every opportunity of observing the epidemic of typhus and dysentery which followed the famine of 1848. However painful

such experience may have been, it cannot but be a source of gratification to me that I am, on this account, better able, perhaps, to form juster opinions on the subject of the late visitation, during the whole of which my position necessitated my taking a very active part.

I will, with this preface, at once proceed to sketch, as succinctly as possible, a few of the more important events of its early history.

Fort Cunningham, removed about a quarter of a mile from the Royal Barracks at St. George's, is situated on an island divided from its neighbour by a narrow arm of the sea; it forms nearly the easternmost extremity of the groups, and its characters of soil and vegetation differ but little from those of the rest. In the centre of the island is a pond of salt water; its greatest rise at the spring tides never exceeding six inches, stagnant, loaded with organic matter, and in still states of the atmosphere emitting effluvia of a very offensive nature. About 20 feet from its level, and 30 from its margin, rises an old dwelling-house, inhabited by privates Davis and Derring, 56th Regiment, whose occupation is that of labourers on such portion of cultivated ground as the island contained. The wife and three children of the former of these men were also its inmates; the rooms are spacious, but the timber and flooring much out of repair. Embowered in trees, its quaint architecture seemed intended still more to favour a complete shelter from the ocean blasts.

In this house then, on the 13th of August, the woman was seized with rigours; for two days previously she had been complaining, but did not call for medical aid; headache was severe, the stomach irritable, the vomited fluid green and bilious, and constipation of the bowels obstinate; as her disease progressed, the remissions, which were at first well pronounced, became less distinct, the conjunctiva assumed a yellow hue, the matters ejected from the stomach throughout retained their bilious character, and the alvine secretions were also tinged with dark bile; coma supervened, and she died on the seventh day of her attack. It is much to be regretted that no autopsy was permitted, as the body had, at this period, assumed a yellow hue. The case was attended throughout by assistant surgeon Deeble, and before its fatal termination by myself also; on its nature I imagined that we were both agreed, and that it was one of the ordinary bilious remittent, identical in type with the many instances of this disease which it had been my lot to witness in Eastern practice.

At an after period, however, in the course of a casual conversation among strangers, assistant surgeon Deeble seemed to have pronounced it as partaking of all the characters of the true hæmigastric pestilence; and on this opinion reaching the ears of the acting Governor, I was at once interrogated on the subject. In adhering to my former opinion, I attempted in my reply to show that simple yellowness of the surface, so ordinarily a concomitant of these fevers, could not alone be taken as a diagnostic sign of the more malignant disease, in the absence of the characteristic vomit and of its allied hemorrhagic tendencies. On the 28th August private Davis, his son, and private Derring, all occupants of the same house, were admitted to the regimental hospital with adynamic remittent fever. Short abstracts of these cases from the regimental records are to be found, Appendix No. 1, from which it will be seen that yellowness of the surface did not amongst any one of them show itself, and that they all recovered.

Not appended, as being too strictly professional; they will be laid before the Medical Board.

The troops at Fort Cunningham consisted of a detachment of 23 men and one officer. The barrack-room ordinarily occupied by them was under repair, and for five days previous to the attack of Mrs. Davis they had been encamped on an elevated mound without the walls of the fort. On the 1st of September two of these men were admitted to hospital with similar symptoms to those already described, and on the 3d two more cases made their appearance. It will presently be seen that several men in the Royal Barracks at the same time began to suffer, but the number of admissions from Fort Cunningham being somewhat in excess comparatively to their strength, they were ordered to remove the encampment on the 4th of September, and accordingly became located at Ferry Point, from which place several of their number were afterwards admitted to hospital suffering from severe forms of the disease.

We must now retrace our steps to the date preceding the one on which we commenced our history, viz., the 12th of August. On this day a convict on board the hulk "Thames," Robert Hall by name was, simultaneously with Mrs. Davis, attacked

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attacked by the disease. I need not for a moment dwell on the complete impossibility which existed of any communication between these two parties. The convict died four days afterwards. A second was attacked on the 18th, and his case proved fatal on the 27th August, with, I believe, very unequivocal symptoms of black vomit; this, however, was a fact that only subsequently transpired. I may here allude to what must hereafter be more fully described, the situation of this hulk. Grounded for years in a bank of mud, at a corner of the harbour remote from any influence of tide or current, beneath a shelf of sandy rock which radiated from its south-western aspect the concentrated solar influence, and protected by it from the northerly and easterly breezes, ingenuity could hardly have devised a situation more calculated to bring into being and foster every morbific agency. This cradle of disease was visited, on the 20th August, by one of those furious storms to which the Bermudas are occasionally subject; a strong southerly wind had been blowing throughout the night of the 19th, with a thermometer at 80° Fahrenheit, barometer 29°,83, and with a high degree of atmospheric saturation; no electric disturbance was observed. Early on the following morning the wind veered round somewhat to the west, and underwent a steady increase, attaining its maximum about three P.M., when its pressure was nearly 24 pounds. Under this weight the hulk was endangered by the parting of her principal mooring chains; her crew of convicts were, during the day, much exposed and fatigued in necessary exertions to repair the injury. On the 21st the gale had lessened, but its violence had everywhere blasted vegetation, and having shifted this day still more to the westward, a current of air was borne direct from the ship to the officers' quarters in the Royal Barracks, and the nauseous stench from the disturbed mud, in which she was imbedded, will never be forgotten by the many who were present in the verandah. Soon afterwards the tank-water, from which this end of the barrack was supplied, became putrid and unfit even for purposes of ablution; the tanks in rear of the men's barracks did not, however, partake of the infection. This state of the water may be accounted for. A group of Pride of India trees, of luxuriant umbrage, shaded the first-named quarters, and their foliage, destroyed by the gale, was blown over the roof of the building, which they protected, and washed by the subsequent rain into the reservoirs, where rapid decomposition took place; the mortality which followed in the servants' quarters, situated immediately above these tanks, may, I think, in part be attributed to this cause.

The death of the convict, on the 27th of August, was soon followed by other casualties, and from this date the disease on board the fated hulk assumed a malignancy only equalled by the rapidity of its onward spread. By the 12th September her upper decks were one vast lazar house, where disease and death in their most loathsome forms seemed struggling for mastery over forms that a few short days before were revelling in health. The livid face smirched by the inky fluid that fountained from the mouth, the cracked and blistered surface from whose fissures the life-blood was welling up, the agonised groans of the few, and, hardly less painful to witness, the stolid indifference of the many, formed a picture which seems, in the retrospect, the fruit of some distempered dream.

On the morning of the 31st August four fresh cases presented themselves in the 56th regiment; Franks, an officer's batman from the range of servants' quarters; Taylor, from No. 6 barrack-room; Potter, from the band-room; and, in the evening, another man from No. 6 was brought to hospital, in a state of maniacal excitement so violent that it was only subdued after copious venesection; of these the second only died, and this on the fifth day of the attack.

A minute examination of the barracks, as well as a daily health inspection of the men, was at once organised; and Mr. Farr, the senior medical officer in the command, consulted as to the propriety of encamping the troops, but the disease at that time appeared so limited in its extent, and so comparatively mild in character, that, misled by its insidious onset, we considered that we should not be justified in recommending a step which, by the panic it would create, the additional exposure of the men at a damp season, and expenses it would necessarily incur, did not then seem urgently to be called for. The 1st September brought with it four new cases in the 56th, two in the Ordnance corps, and several of the wives of the soldiers living in the densely crowded and filthy alleys of the town were seized with the disease. The earliest of these cases was that of Mrs. Ashley, the wife of a soldier of the 56th regiment, inhabiting a detached building on the summit of the cliff overhanging the "Thames," and hers was the

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the first pronounced instance of black vomit. The adjoining house was the one next attacked, and, like radii from a circle, of which the ship was the centre, the malignant epidemic spread (*See* Map, Appendix 2).* On the evening of the 2d September all the families of the soldiers (56th) were, with much murmuring, removed from the town to a large plain in rear of the barracks, and dividing them from the hospital, the ground dry, and so scantily alluvial as hardly to afford holding for the tent pegs; its aspect northerly, and flanked towards the east by a cedar grove. (*See* Map.) Some heavy storms, soon after the camp had been formed, perhaps acted as a stimulus to the disease, and its fatal character expanded here at an early period. On the 5th September the Regimental Hospital was relieved of its convalescents, who joined the Ferry detachment, now constituted into a depôt for this purpose. Some fresh attacks of fever continued to arrive from this station.

* Not printed.

The accompanying table (No. 1.) will show that the succeeding cases, up to the 9th instant, were numerically few and insidiously mild, attended with but little outward sign, or by inflammatory fever; the fell poison, unseen, was hollowing out the vital centres; stealthily it crept onward till the dreaded black vomit threw its pall over the scene. On the night of this last-mentioned day, wearied out by active exertions, with one assistant already prostrated by the destroyer, I retired to rest; summons after summons came to the bedsides of the freshly attacked, and when I again sought my pillow the loud hammer of the carpenter, preparing for the yet living the narrow tenements of the dead, chased away all power of sleep; we had been at once overtaken by, and were in the midst of, a direful epidemic.

Immediate retreat became necessary; the tents, which we had been assured were sufficient to supply 1,200 men, were found inadequate to the accommodation of a fourth of this number. A Sunday intervened, and Monday came with storms and rain. Tuesday, the 13th, broke dismally over St. George's, but by eight A.M. there was a temporary clearance, the barracks were evacuated, and the only troops left there were the occupants of the forts, which had not been attacked, and the sappers, who were about to follow our example elsewhere. The measure had been too long delayed, however, to bring with it all the advantages which would have occurred had it been earlier adopted; the exposure and slight fatigue of the march, acting on frames already predisposed to the disease, gave it a greater impulse, and 14 men, principally stragglers on the line of march, were returned to the Regimental Hospital; very many to die. An easy communication by water existed between this building and the main body of the regiment at Ferry Point; this establishment was retained in St. George's, as there were neither buildings nor tentage available for its removal elsewhere. The disease now spread with fearful rapidity. Most of the Europeans who had remained in the fated town were attacked, and the numbers in hospital, by constant increment from Ferry Point, were much in excess of the accommodation; the lower verandahs were, at one side of the building, enclosed for the sick by sails, and the large military chapel was soon filled by what appeared to be the less severe forms of the complaint. Colonel Phillpotts, the acting Governor, had succumbed to the disease, and both the officers who succeeded him in the command were almost immediately prostrated by it, numbers of the European families in the town were dying, and the atmosphere of the hospitals so became centres of infection that none could enter their chambers with impunity.* All these circumstances so clearly pointed to the great advisability of sweeping away the entire hospital establishment to another part of the island, that it became necessary, in the teeth of the most formidable difficulties, to make the attempt. Deputy Medical Inspector Hilditch, of the navy, agreed to receive 35 sick in the Naval Hospital at Ireland, and I determined to place the remainder in the buildings at Port's Island, above 15 miles away, in charge of Dr. Frederick Hunter, a civil practitioner attached to the forces.

With

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* Of four European medical officers doing duty in St. George's, three were attacked by the disease and one died; of three native Islanders, one was attacked and a second became jaundiced Of nine orderlies doing duty in the hospital, six were attacked and three died. Of the Fort Victoria detachment, 88 in number, who supplied parties in and about the hospital, and dug graves and assisted in burying the dead, 64 were attacked and 34 died, including an officer; there were 56 men, besides 18 artillery men, of whom 10 died.

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With inefficient transport, without officers military or medical, and companies disorganized by illness and death, 100 sick and dying men had to be removed to a long distance. Notwithstanding the accidental delays in carrying these measures into effect, and the consequently increased mortality, I cannot on the retrospect but wonder at the regularity and comparative ease of their exodus. The Kite steamer, with an open launch in tow, was ordered to embark the disabled soldiers at the nearest point to the hospital, but no communication was permitted between the launch and the vessel; she made her appearance in the afternoon of the 25th September, but in consequence of stress of weather, the sick could not without extreme risk be exposed to its influence in so unprotected a manner. As her orders did not permit her remaining, she went back to Ireland Island, and a delay of some days took place before she attempted to return; eventually her superannuated machinery refused to perform its office, and we were thrown back for the means of transport on the small cutters, which form the ordinary channel of communication. Litters for the sufferers were constructed, and their journey of a mile from the wharf was thus accomplished; the winds were light, and the voyage consequently long, but the move was attended with benefit so signal, that of 35 men selected as subjects requiring the most assiduous care on account of their precarious condition, and sent to the naval hospital, but eight subsequently died; those whose state offered no chance of amendment were not removed from St. George's; on the day following, the remainder were sent to the station prepared for them at Port's Island. The Ordnance Hospital was next evacuated, and placed at Prospect Hill, in charge of Dr. P. Tucker, another civil practitioner, and the removal was attended with equal benefit. The last-named building was retained as a temporary recipient for any fresh cases which might occur amongst the remaining garrison now almost entirely removed, and these as they collected were shipped off to the various appointed detachments, where provision had been made for their reception.

Such is a brief sketch of the September epidemic amongst the troops which, as we have seen, was confined almost entirely to the town and island of St. George's, but those quartered at Ireland did not entirely escape, and so early as the 1st of the month a man was admitted (corporal Sharratt) with remittent fever; his case terminated favourably. It was soon followed by others, which during the month continued to make their appearance. The type of the disease was less deadly, and more readily amenable to treatment. At Hamilton, where a single company of the 56th regiment was stationed, two cases of fever showed themselves about the 20th of September, and a third soon after; a man who had clearly contracted the disease in St. George's. The company were at once removed to the country, and placed in a hired building, and only 14 or 15 cases subsequently occurred.

The convicts at this end of the island were less fortunate in their exemption, five cases were observed on board the "Medway" hulk before the end of August, the number greatly increased in the following month, and was attended with considerable mortality; in October this attained its maximum, and by the end of December one-third of the entire number of those on board had been attacked, with a loss of upwards of 40 souls.

6. After a careful examination of all the evidence in favour of its importation, I think that it has signally failed in bringing forward anything that can throw a suspicion on its domestic origin. A zymotic principle appears to have been present in the atmosphere from the very commencement of the year, showing itself first in sporadic cases of yellow fever, afterwards in epidemic hooping cough, amongst the inhabitants, and in cholera, dysentery, and diarrhœa amongst the convicts, and eventually, when the season favoured it, in remittent fever, which has in Bermuda been peculiarly the disease of autumn.

8, 9. On the question of its communicability opinions are much divided, but I do not think that we have witnessed anything sufficiently decisive amongst all the disclosures of the late epidemic materially to modify the conclusions at which the scientific world has elsewhere arrived. It can hardly, I think, be doubted, that in common with many other forms of fever, it does possess a limited amount of communicability, the grade of which is determined by the varying conditions of atmosphere, of locality, and of the individual. That the poison moreover emanating from the bodies of the diseased, may by their congregation generate an atmosphere specially infectious, although by segregation it may become so diluted

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diluted as to be deprived of its active power; there seems also much reason to believe that it may be communicated through the medium of fomites.

At the same time, although the cases favouring this view afford strong presumptive proofs of the communicability of the disease, a very ordinary amount of ingenuity may devise explanations which would refer its effects to the influence of local rather than of personal causes; so many negative proofs may also be adduced opposed to the doctrine of contagion, as clearly to show that this property of the disease has in the hands of many been much exaggerated; nevertheless, after giving to all evidence and argument its due weight, the conviction is forced upon us that we should not be warranted, in the present state of our knowledge, in abandoning a system of quarantine, a precaution founded on and guided by the principles of good sense.

10. The close analogy between the spread of epidemic diseases and the principles which regulate fermentation has long been a source of remark, and given origin to the word zymotic. The presence of this influence here, the beginning of the year, has already been referred to. When such constitution of causes exists, I believe that an impulse and direction may be given to them from without, and the type of disease be determined or modified by inoculation; but we have no evidence to prove that this condition of atmosphere and locality can be imported; thus the malignant character of the late epidemic in St. George's seem derivable from the intense gaol fever which was elaborated on board of the "Thames" hulk. It seems, too, highly probable that the much vexed question of the alleged introduction of the Boa Vista fever, by the "Eclair," was a case of this sort.

I believe, further, that in every case in which an epidemic has appeared, it will be found to have given ample notice of its approach, in the shape either of sporadic cases of milder character, or in a modification of the forms of the existing disease. In 1843 it was ushered in by a great prevalence of diarrhœa in the Rifles and 20th Regiment; a similar occurrence took place this year amongst the convicts. Colonel Tulloch, in his special report, remarks, after enumerating the epidemic prevalence of typhus in the town on several occasions between 1838 and 1846, "that, on these occasions, the disease was preceded by a general prevalence of diarrhœa amongst the men." In the years 1847 and 1848 the approach of cholera was telegraphed to every European city in which it occurred, by the prevalence of influenza, typhus, or others of the same category.

See reports on sickness and mortality in Bermuda. Diarrhœa was extensively prevalent in 1842 amongst the troops.

11. Without doubt whenever passengers, emigrants, and others are, owing to stormy weather, much confined to the berths below, some form of malignant disease is sure to make its appearance, and its nature will be determined by locality and by atmospheric conditions; yellow fever, if in the west, and cholera or bilious remittent in the east. In the "San Francisco" steamer, a few weeks since, cholera made its appearance, as a result of exposure to cold and wet, and the use of improper diet, and no one would search for a distinct seminium of this disease, unconnected with these directly exciting causes. In 1779 a gaol fever broke out in the King's Prison, in Bermuda, the result of filth and overcrowding, while conditions most favourable to its spread existed; an epidemic was the result, which proved very fatal in the veteran battalion quartered in St. George's. At Medina Sidonia, 30 miles distant inland from the Spanish coast, a similar instance occurred, and yellow fever raged there, when no other town, either on the sea port, or the interior, was affected.

12. The ration of the soldier consists of 7 lbs. of bread, 5 lbs. of fresh beef, and 2 lbs. of salt pork weekly; 3*d.* per diem is expended in tea, sugar, and vegetables; about as much, on the old "half crown out of sixpence" principle, on rum; the morning dram, by far the more injurious than the rest, is taken, I believe, in every eight out of ten cases.

The cubic space allotted to each varies, at St. George's, from 377 to 409 feet; and at Ireland, from 288 to 380. The ventilation at the latter place is, however, more perfect, and the barracks better constructed.

No system of barrack accommodation, however, can be other than faulty in a tropical climate (unless habitually swept by trade winds,) which does not afford at least from 700 to 800 per man, and is moreover furnished with means of artificial ventilation.

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13. Without question, we have seen the disease to be peculiarly that of the unacclimatized European; we have seen it by preference attack the healthy and plethoric, and tell on them with an effect deadly in proportion to their previous immunity from disease. Some interesting facts have been developed in connexion with these points. 1st. As to acclimatization: it has been clearly demonstrated that the quantity of animal heat generated is less in summer than in winter, and that this becomes a physiological condition which when once established, it is a work of time to undo; hence we find that it is during the transit from one season to another that the system is most obnoxious to disease; that a winter constitution, not immediately yielding to altered conditions of temperature, generates ailments which are of asthenic and inflammatory character; that, as the season advances, the vigour of the system declines, less animal heat needs to be developed, a lighter tax is imposed on the vital powers, and that its pathological characters are asthenic or depressing. While these changes are clearly indicated in our native climate they are thrown into bolder relief on removal to a tropical one, and hence the temperature of the unacclimated European ranges for a long period; according to Dr. M'Kettrick, between three and four degrees above that of the seasoned inhabitant;* the pulse is more rapid and bounding, and a state of plethora generated, itself eminently a predisponent to disease. In winter the appetite is more vigorous, and highly azotized food most congenial to the wants and expenditure of the system; as summer approaches, fruits and vegetables, offered more abundantly by nature, are equally called for by the instinct. Thus, too, we see, that while the Esquimaux or the Laplander delights in fats and glutinous food, the diet of the Indian consists almost purely of rice and vegetables. The application of these remarks is easy; the European soldier enters a climate warmer than the one he has been accustomed to, in a condition to generate a larger amount of heat than is required by nature; the tendency is still further encouraged by a stimulating diet, which, however requisite for his well-being under other circumstances, becomes now positively injurious; the blood, increased in volume, is vitiated by the presence of unassimilated chyle; the stomach and viscera lose that balance of energy which constitutes health, and are unable to elaborate the food which is pressed upon them; a provision passing wise, because the growing evil is thereby held in check; diarrhœa, perhaps, supervenes; an effort of nature to relieve herself of the undigested food, or vitiated secretion, or the state of plethora established, bursts into flame as fever, whereby a temporary suspension of nutrition is effected, and the wanted equilibrium restored. This view receives ample confirmation from the statistical reports of the sickness amongst the African troops in the West Indies: "We are informed," says Dr. Armstrong, in quoting from this source, "that there is no country, either temperate or tropical, in which the mortality among the indigenous civil inhabitant, between the ages of 20 and 40, seems materially to exceed 15 per thousand annually, yet, among the black troops and pioneers, 40 have died out of every thousand annually, so that the rate of mortality is at least thrice as high among this description of troops as in the native army of the East Indies. Farther, the same liability to a high rate of mortality seems to affect negro troops in almost every quarter of the globe where they have been employed; even at Sierra Leone, on the east coast of their own continent, the mortality has averaged not less than 28 per thousand annually, being about double the ordinary rate among other troops serving in their native country."

"The black troops and pioneers in the West Indies consist of free blacks, generally more intelligent than the ordinary negroes, as they are natives of the country, and consequently assimilated. They cannot be supposed to possess any peculiarity of constitution which renders them obnoxious to the climate; and more especially as it is similar to that in which their parents or progenitors had their origin; as the great mortality is also observed among the native troops on the coast of Africa, some other cause must exist besides climate alone."

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* I doubt if this estimate be not too high as an average; it does exist, and its influence as a predisposing cause of fever is clearly shown in the fact. Pregnant women, the temperature of whose bodies is invariably in excess of the standard of health, are peculiarly liable to the febrile attack, and this in its most aggravated form.

Let us observe the circumstances under which they are placed: among the blacks, in the West Indies, the quantity of animal food consumed is much less than the ration of a European soldier, yet, when these men enlist, they are at, once placed upon a highly nutritious diet, to which they have never been accustomed, and which the wants of the system do not require; plethora is the consequence, and a greater liability to disease. With the native troops in India the case is different; here religion interposes a barrier against an indulgence in animal food and strong drink. The rations of the native troops are different from those of the European soldier, yet it is more nutritious than that of the great majority of their countrymen in civil life, and by inducing plethora may operate as the cause of the increased rate of mortality amongst them. The habitual intemperance of a soldier's life is another of these causes which, taken singly, would alone predispose him to disease; and this fact appears so self-evident that I should not longer dwell upon it, had there not existed an idea that temperate men usually suffer in no disproportionate degree with those of more dissipated habits. We must, however, recollect that many so called temperate men amongst the soldiery would, in private life, be almost considered drunkards of the first water, and that the morning dram is to some of them a necessary of life.* During the late epidemic I do not hesitate to affirm that at least one-third of the cases of febrile attack had for their exciting cause that bane of the soldier, drink. In enumerating the predisposing causes of disease in this class of the community, idleness should have a prominent place. We cleanse our sewers, and talk of cubic space for the lungs, but we allow no expansion for the mind. The occupation of the soldier is drudgery; of amusements he has none; his physical condition can only be improved by elevating him morally; establish reading-rooms, and let their shelves rather contain the lighter literature of the day than be encumbered with the more solid tomes, that are only attractive to the well-formed taste; give him out-door amusements, and by rendering him happier, punishment, when deserved, becomes the more galling from contrast. Another cause of disease may be found in the unavoidable exposure of the soldier to nocturnal influences, often when under the depressing effects of previous excesses. I believe that much of the mischief attributable to this cause might be avoided by allowing all men on sentry to smoke.

17. The town of St. George's, numbering about 250 houses, containing a population, besides its garrison, of 1,600 souls, is situated in the broadest part of the island of that name; it rests in a semi-circular valley which faces the harbour; the soil is composed of the same friable coral rag which elsewhere forms the basis of the group, covered to the varying depth of some feet with rich alluvial deposit; a considerable portion of it was evidently in former times submerged; in the lowest portion of the town brackish water may be obtained at a depth of six feet from the surface; an easy slope of about 40 acres is thus covered with scattered buildings, to most of which plots of garden ground are attached. The streets are narrow, the alleys numerous, and many of them filthy and crowded; the material of which the structures are formed, is in the same rock above spoken of; in its fresh state it is saturated with saline matter, and on this account absorbs and retains water; the roofing, too, from the same cause, is seldom water-tight; drainage and cesspools are almost unknown; the deep pits which form the receptacles of ordure, are so continually percolated by salt water, that little sensible inconvenience arises from them, and nightmen meet with but slender encouragement; all the interments are intramural, the burial grounds occupy a very central position; the harbour is completely land-locked, and hence the influence of the tide is rather to collect than to remove effete matters; the gradual filling up of the channel between Ordnance Island and the town is an example of this process.

The situation of the barracks and forts is indicated in the annexed map;* the following was the distribution of the force on the 1st of August 1853. The sites of all are well chosen, the general hospital a five-storied building, airy, at a proper distance from the barracks, and although not capable of comfortably containing

* Not printed.

Distribution appended.

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* Sir Robert Sale, in his despatches, notices the complete immunity from disease which his besieged army at Jellalabad enjoyed, although their food was scanty and their exposure to hardship great; he attributed it entirely to the impossibility of stimulating drinks being procurable in camp.

containing more than 60 beds, is well arranged. The barracks themselves are of the following dimensions.*

They consist of but one basement, and are raised from two to four feet above the surrounding level. The principal quarter of the artillery is in Fort Victoria; the sappers occupy temporary buildings of wood to the westward, and the married families have very comfortable and clean dwellings in the neighbourhood; the women appear a much more respectable class than the corresponding wives of the 56th regiment, who chiefly lived in the town in a state of great filth and wretchedness; the proportional mortality of these latter was as four to one.

19. The town of St. George's figures in the first authentic history of epidemic visitation, and from that period to the present one, it has always been a focus in which such agencies, if they did not originate, eventually attained their acmé of virulence. While the aggregation of unacclimatised individuals may be a principal reason for such fatality, the situation of the town itself is calculated to attract and foster any germ which has once become disseminated. However faultless the simple construction of barracks might be, the proximity of so undesirable a neighbour would always be a source of mischief.

The following table is extracted from Colonel Tulloch's reports, showing the comparative mortality, and the number of cases occurring at the three points occupied by troops in the fever of 1843.

—	Ratio per 1,000 of Strength.	
	CASES.	DEATHS.
Saint George's - - - -	831	184·2
Hamilton - - - - -	436	39·4
Ireland - - - - -	505	36·8
	655	113·4

" Thus it appears," adds Colonel T., " that above one-sixth of the troops serving at St. George's were cut off, while at Hamilton the loss was only 1 in 25, and at Ireland 1 in 27 of the strength.

The following Table expresses the Mortality in 1818–19.

Naval Hospital, Ireland Island.

1818.

Quality, and from whence Received.	No. of Cases.	Cured.	Died.	Ratio of Mortality.
Her Majesty's Ships and Vessels - - - -	6	3	3	1 in 2
Naval Yard - - - - - - - - -	81	61	20	1 in 4
Soldiers - - - - - - - - - -	18	13	5	1 in 3·6
Totals - - -	105	77	28	1 in 3·8

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* Two end rooms, 24 feet 8 inches by 40 feet 9 inches; centre, 24 feet 8 inches by 41 feet. Height from floor to eave, 10 feet. Average cubic space per man, 392 feet. Sappers temporary barracks, 420 feet.

Appendix.

Answers of J. H. Ker Innes, Esq.

1819.

Her Majesty's Ships and Vessels - - - - -	20	14	6	1 in 3·3
Naval Yard - - - - - - - - -	66	49	17	1 in 3·9
Hospital Servants - - - - - - - -	2	2	—	—
Transports, &c. - - - - - - - - -	6	4	2	1 in 3
Soldiers - - - - - - - - - -	12	12	—	—
TOTALS - - -	106	81	25	1 in 42

At St. George's the Number of DEATHS, as published in 1819, is as follows:

Inhabitants of St. George's, including natives, Europeans, and Americans - -	43
Seamen - - - - - - - - - - - - - -	42
Royal Engineer Department - - - - - - - - - - -	1
Sappers and Miners - - - - - - - - - - - -	21
Women and Children - - - - - - - - - - -	5
Royal Artillery - - - - - - - - - - - - -	5
Women and Children - - - - - - - - - - -	4
15th Regiment: 63 Men, 11 Women, 14 Children - - - - - -	88
TOTAL - - -	213

The epidemic made its appearance here in August.

25. The position of these islands is within what has been called the Yellow Fever Zone, and there can be but little doubt that they contain within them all the elements necessary for its production. Amongst the troops, however, sporadic cases have been very rare; the tables of Colonel Tulloch afford some valuable information on this point; to which I would invite the attention of the Commission. I have added a table of this class of disease, which brings the date up to the year 1852.

At the same time it will be observed from his remarks, that fevers of the continued type have been the cause of one-half, and diseases of the lungs of one of the entire mortality amongst the troops stationed here.

The hygrometric state of the atmosphere, as affecting the carrying power of the wind, cannot be doubted; and when an accumulation of electric fluid near the surface of the earth is superadded, the development of morbific miasms is probably still more favoured. Although the climate in which we live is essentially a moist one at all times, I am unable to trace any appreciable difference between the registers for 1852 and 1853; indeed, if there be any, it would rather point to an excess of saturation in the former year.

29. The plethoric and healthy seem to have suffered in greater proportion than the spare or sickly; the almost complete immunity enjoyed by the native population, especially the coloured, is in character with the previous experience of epidemics in these islands. A remarkable fact, which well illustrates the effect of acclimatization is mentioned by Dr. Browne, in recording the Sierra Leone epidemic in 1837 and 1838; he says, that "almost every apprehension of yellow fever had ceased when, without any assignable cause, it broke out with as much virulence as during the most unhealthy epoch of the colony;" it seems "also, it was exclusively the disease of the European, because during the whole of this dreadful mortality a detachment of from 40 to 50 black soldiers, of the 2d W. I. Regiment lost only one man, and I had seldom any in hospital; but the returns from the West Indies show that the African is, when absent there, more liable to attacks of fever than in his native land, and his rate of mortality is two, three, or even five times as great in some of these islands as in others."

31. The poison which propagates it seems rather to be truly zymotic than actually contagious. I look on the predisposition engendered by an epidemic

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state of atmosphere as one of the conditions essential for its spread; the emanations from the dead body would undoubtedly, under these circumstances, exert a noxious influence, which would be increased should decomposition have commenced; but I do not think that the mere question of contact would carry with it much importance. It is not unreasonable to suppose that articles liable to retain animal effluvia are capable, too, of conveying the disease; without exception, during the early part of the epidemic, all such men as were employed in remaking hair beds which had been used by fever patients, became affected very soon afterwards with the disease, the premonitory nausea seizing many of them whilst so employed; and one of the most fatal employments amongst the soldiery during the epidemic, was digging graves after the cemetery had become saturated with animal matter.

32. Yellow fever, perhaps, more than any other disease of its class, has shown itself, independent of such causes; undoubtedly where they exist the fermenting principle is assisted by their agency in its work of desolation, and is even attracted by them; in Bermuda its ground has not been chosen with any partiality for marshy situations they seem, as well in epidemic as in ordinary periods. to exert so perceptible an influence on the sanitary condition of the population. Dr. Fergusson has recorded the fact, that in climates subject to putrid fevers a sandy soil is as frequently productive of a malarious state as a marshy one; and, without attempting to explain it, instances the Alemtago and Algarve of Portugal, regions almost exclusively sandy, and the most prolific of fever of any in the Peninsula. Such is also found to be the case in Egypt, Asia Minor, Persia, and Sindh; at the foot of the Bolan Pass, Dadur is entirely sandy, and free from any sources of palludial exhalations, and yet is productive of one of the most virulent of putrid fevers.

The marshy Honduras, and the dry Vera Cruz, equally enjoy a comparative immunity from the disease, while Rio Janeiro, where there are but few marshes, is very subject to it; Barbadoes, too, is said to be as liable to such attacks since its extreme state of cultivation, as formerly, when the lands were undrained, and lying waste.

I think that all evidence goes to prove that a toxeemic agent is generated in the surrounding medium possessing highly septic properties, but whose production is not necessarily connected with sources of decomposition; that where these exist, whether they have their origin in a palludial, or simply a telluric source, or equally, whether generated by the animal exhalations of aggregated masses, they serve as points of attraction where a reproductive fermentation is called into being.

When fever prevailed to a frightful extent amongst the troops in Upper Scindh, I have often at night been exposed with impunity for hours, whilst wildfowl shooting, at what are considered the most concentrated sources of the poison, whose effects, even when infinitely diffused, were supposed to be deadly; the neighbourhood of such situations remained free from any disease; the troops who marched over them, and daily encamped there, continued in the enjoyment of health; it was only when the epidemic influence prevailing on the rock of Sukhur was encountered that every drain, and cesspool, or room, abounding in exhalations from the living body became impregnated with its poisonous property.

33. Amusement, instruction, gymnastics, cleanliness of person, sufficient ventilation, and segregation during the season of autumn, by the occupation of camps, interchanging their inmates frequently, by the establishment of barracks at a distance from any town in which anything approaching overcrowding should be sedulously avoided. By the return of the equitable insurance companies in England, it appears that out of 4,095 fatal disease happening amongst the better classes, 489 only result from zymotic diseases, or about 12 per cent.; which is less by one half than the mortality from this class of diseases in the metropolis generally. Who, after such evidence, would argue that the whole of this family of diseases are not under the control of man, and by him preventable?

34 and 35. On the removal of the force to Ferry Camp an immediate increase of sickness and mortality was observed, exposure probably acting unfavorably on those whose systems had already become infected with the poison. For eight days the number of admissions to hospital was in excess of that before its locality had been altered; if, instead of canvas, the troops had been removed to buildings, which would have afforded more efficient protection, I think that the change

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change would have been more favourable; had none taken place I believe that, from the intense localisation of the ferment at St. George's at an after period, that two-thirds of their number would have fallen victims to it.

But few new cases presented themselves after the first week in October, at Ferry Camp.

At Prospect Hill only 53 cases appeared after removal, several of these were importations from St. George's; 20 of their number died.

At the Naval Hospital at Ireland, whither 33 of our worst cases amongst the sick were sent, eight of the number only died; an immediate and most signal change for the better having at once followed their removal.

At Port's Island the strength, exclusive of hospital patients, never reached 40 men, and 13 fresh cases originated in this locality, of which eight died; there is reason to suspect, however, that two of these might have been imported.

At Bluck's Point 16 cases occurred after removal from the barracks they occupied in Hamilton; five of these died, but the end of two of them was hastened by previous debauchery and exposure in some of the low houses of the suburb.

At Tucker's Island there were but three very slight instances of its appearance, which is partly attributable to the difficulty with which the men could obtain liquor, and partly to their being a detachment from Ireland Island, the garrison of which was comparatively healthy.

36. The only rational explanation which seems to offer itself is, that Bermuda, in common with other islands in the same latitude, is situated on the northerly edge of the yellow fever zone; and while ordinarily enjoying much immunity from fever disease it only becomes subject to such epidemic attacks in the autumnal months, when the febrile tendency is at its maximum, and only then, when concurrent causes, rarely happening, conspire to excite it.

37. *See* "Royal Gazette."

38. That the garrison of the forts at the east end of the island occupy the Royal barracks at St. George's, having, within the forts themselves, only a sufficiency of men for their safe custody; that the wooden barracks of the sappers should be vacated, and a portion of the Royal barracks be at once assigned to them.

Besides the erection of permanent quarters for the men in a central situation, and at a distance from any of the townships, I would have, attached to the signal stations, houses, on the model of those at Port's Island, capable of accommodating each a company; or, if it were thought advisable, one on Tucker's Island or Castle Island; that but few men should ordinarily occupy them, but that always, in the autumn season, they should be garrisoned by parties who should frequently interchange their locality, thus relieving the central barracks of at least one-half of its population during this period of the year.

(signed) *J. H. Ker Innes,*
Surgeon 56th Regiment.

Surgeon Innes states, "I remember the arrival of the Spanish war steamer, 'Blusco-de-Garay,' at Bermuda, in August last. I was acquainted with several of the officers of that ship, and was frequently on board. I went all over the ship, and especially visited the sick bay, in company of the surgeon of the ship; there were no fever patients on board, that I saw. Before going on board I inquired of the surgeon whether he had any cases of fever on board, and he assured me there were none; nor did the sick I saw appear to be labouring under fever. When I visited the sick bay assistant surgeon Deeble was not with us, but I know he visited the bay on another day. During the stay of this ship at Bermuda I was frequently in company with her officers, both on shore and on board, and nothing ever occurred to lead me to believe that the epidemic ever could be attributed to her arrival.

Question 20.—Distribution of the Troops serving in the Bermudas.

STATIONS.	Commanding Officers at each Station.	Corps or Detachments Composing the Garrison at each Station.	EFFECTIVE STRENGTH.								
			Field Officers.	Captains.	Subalterns.	Staff.	Serjeants.	Trumpeters or Drummers.	Rank and File.		
									Rank and File.	Sick.	Total.
Saint George's -	Lieut.-Col. Robe -	Royal Artillery -	1	1	2	1	3	1	89	6	95
	Colonel Phillpots	Royal Engineers -	1	–	2	–	–	–	—	–	—
		Royal Sappers and Miners.	–	–	–	–	1	1	34	12	46
	Major Oakeley -	56th Regiment -	1	3	6	5	25	16	389	50	439
Hamilton - -	Captain Austin -	56th Regiment -	–	1	1	–	5	1	84	–	84
Ireland Island -	Lieutenant Higgin	Royal Artillery -	–	–	1	–	1	–	43	1	44
	Captain White -	Royal Engineers -	–	1	1	–	–	–	—	–	—
		Royal Sappers and Miners.	–	–	–	–	3	1	39	2	41
	Major Byles -	56th Regiment -	1	1	6	1	17	3	277	4	281
Fort Cunningham -	Ensign Whitmore	Royal Artillery -	–	–	–	–	–	–	3	–	3
		56th Regiment -	–	–	1	–	1	–	24	–	24
Ferry Point - -	- - - - -	56th Regiment -	–	–	–	–	–	–	4	–	4
Prospect Hill -	- - - - -	Royal Sappers and Miners.	–	–	–	–	–	–	1	–	1
Hen Island - -	- - - - -	Royal Artillery -	–	–	–	–	–	–	1	–	1
Boaz Island - -	Lieutenant Cumming	56th Regiment -	–	–	1	–	1	–	40	–	40
Fort George - -	Lieutenant Martley	Royal Artillery -	–	–	–	–	–	–	3	–	3
		56th Regiment -	–	–	1	–	3	1	46	–	46
	Prisoners - -	Royal Artillery -	–	–	–	–	–	–	1	–	1
		56th Regiment -	–	–	–	–	–	–	14	–	14
		Total - - -	4	7	22	7	60	24	1,092	75	1,167

Bermuda, 1 September, 1853.

1853.

Abstract showing the state of the prevailing Disease of Yellow Fever in the 56th Regiment at St. George's, from the 28th of August to the 30th of September 1853.

DATE.	Daily Admitted into Hospital.	Number of Deaths.	DATE.	Daily Admitted into Hospital.	Number of Deaths.
August - - - 28	2	–	September - - 15	21	8
„ - - - 29	–	–	„ - - - 16	27	5
„ - - - 30	–	–	„ - - - 17	16	10
„ - - - 31	3	–	„ - - - 18	10	10
September - - 1	4	–	„ - - - 19	6	13
„ - - - 2	1	–	„ - - - 20	12	9
„ - - - 3	3	–	„ - - - 21	15	9
„ - - - 4	6	2	„ - - - 22	8	10
„ - - - 5	9	–	„ - - - 23	2	9
„ - - - 6	8	1	„ - - - 24	6	9
„ - - - 7	7	2	„ - - - 25	4	7
„ - - - 8	5	–	„ - - - 26	4	3
„ - - - 9	3	3	„ - - - 27	4	3
„ - - - 10	7	–	„ - - - 28	–	–
„ - - - 11	5	1	„ - - - 29	–	–
„ - - - 12	10	–	„ - - - 30	11	1
„ - - - 13	32	–			
„ - - - 14	14	5	Total - -	265	120

Answers of Assistant-Surgeon Munro.

No. 15.

ANSWERS of Assistant-Surgeon *Munro*.

1. I HAVE been upwards of nine years in the army, and have served in England, the Cape of Good Hope, North America, and latterly in Bermuda.

2. I have been employed during three epidemic visitations, besides the late one in Bermuda, viz., dysentery at the Cape of Good Hope, cholera and smallpox in England.

3. On the 10th of October 1853, I took charge of the hospital at Prospect Hill, in which there were at that time 12 cases of yellow fever.

On the application of the officer commanding at Bermuda to the authorities at Halifax, for medical aid about the end of September last, I offered my services, and was sent down accordingly. I arrived on the 8th of October, and landed at Ireland Island, and on the following day was ordered to proceed at once to Prospect Hill, whither I went on the 10th.

4. Of the 12 cases mentioned under Question No. 3, four originated at St. George's, and were sent from thence to Prospect Hill; the other eight were taken ill within a few days after their arrival at Prospect. Four out of these 12 died, and one was a case of true black vomit. These eight men, I have no doubt, contracted the disease before their arrival at Prospect, and prior to their leaving St. George's.

5. I had charge of the hospital at Prospect Hill from the 10th of October to the 23d of December 1853, and treated in it 35 cases of genuine yellow fever. I have seen upwards of 30 more, but these were not under my own care; 11 of these 35 died.

6. The climate of Bermuda is almost tropical, and during the greater part of the year the atmosphere is loaded with moisture, there is little or no variety of temperature, and the prevailing winds are southerly and light; vegetable growth is rapid, and animal life extensive, consequently the decay of the former must be considerable, and the exuviæ and deposits of the latter abundant. The heat of, and moisture in the atmosphere therefore acting on this dead vegetable and animal matter, must produce effluvia or miasmata, which, however, if the winds be strong enough, may be driven from the surface; if, however, the atmosphere be still for any length of time, must remain on the surface, and produce effects according to their nature and quantity. The conditions acknowledged to be essential to the production of endemic fever are heat, moisture, and the evolution from the surface of malaria from either decaying animal and vegetable matter, or both. To a considerable extent these conditions must be present in Bermuda, and I am therefore of opinion that the disease originated in the islands. It was a fever of a low putrid type.

7. Unanswered.

8. I do consider the disease communicable. At Prospect Hill three of the attendants in the hospital were attacked by the disease, one of whom died; afterwards when I caused the attendants to sleep in tents, and only allowed them to be in the hospital when on duty, no others of them were attacked by the disease. The man who washed the hospital sheets was also attacked. Dr. Parratt contracted the disease immediately on his arrival in the islands. In October, a child living in a house near Prospect Hill was attacked by the disease (how communicated I do not know) and recovered; shortly after the father and mother of this child were seized with the disease, and both died; and at the same time three other inmates of the house were ill, and one of them died. All the medical officers of army and navy employed to any extent during the epidemic were ill except two. Besides these, there are other cases which prove the communicability of the disease. The man who lived in the private house was a soldier of the Royal Sappers and Miners, and his wife was an Englishwoman.

9. If yellow fever exists in any locality, no person is secure from its attack, and the disease may be conveyed to any locality predisposed for its reception by persons, clothes, bedding, &c., and communicated to individuals by their inhaling the air impregnated with emanations from such articles, and under certain circumstances; I believe it possible that the disease may be communicated by contact also.

10. I do not consider impossible, or even improbable, that yellow fever may

Appendix.

Answers of Assistant-Surgeon Munro.

have been imported, but do not think the statements with respect to the importation of the late epidemic here are satisfactorily proved.

11. Yes.

12. The soldier has three meals a day; breakfast at 8 A.M., consisting of bread and tea; dinner at 10 P.M., consisting of soup, vegetables, and one pound of fresh meat five days in the week, and on the other two days of vegetables, pea soup, and corned pork; the supper is taken at 5 P.M., and consists of bread and tea. An hospital is always provided for the treatment of sick soldiers, and an isolated building generally allowed for the purpose. In the barrack-room the soldier is entitled to a space of 450 cubic feet, and in hospital to 550. The healthy men at Prospect Hill occupied tents; the sick were treated in a stone building, affording ample accommodation for the number.

13. Besides the liability to disease which aggregation engenders, I think exposure during the night, and to the morning and evening air, at which times the atmosphere is loaded with vapour and miasmata, particularly in tropical climates, renders the soldier more liable to disease than other classes of the community; his general intemperate habits also predispose him to disease, but these are not necessary to his position.

14. From the 10th of October to the 21st of November, 20 men were admitted to hospital at Prospect Hill with genuine yellow fever; three of these were hospital attendants; one was the person who washed the bedding (sheets, &c.,) of the sick; one lived in a private house (alluded to in Question 8); three were in the camp from the beginning of October, but had no connection with the hospital; three belonged to the company which came from St. George's on the 18th of October; eight belonged to the companies which came from Ferry Point on end of October; one came from Port's Island; of these last-mentioned 12, all but two had been drinking to excess, and absented and exposed themselves at night. I mention this to show that intemperance and exposure are predisposing causes, and render a man susceptible of the disease when it is once originated.

15 to 25. Unanswered.

26. A hot, still atmosphere, loaded with moisture, is favourable in all positions to the appearance and spread of yellow fever, and especially so in a climate which is almost tropical, like Bermuda.

27 and 28. Unanswered.

29. I do not consider any person secure against an attack of yellow fever, or even from repeated attacks.

30. Inhabitants or natives of a colony to which yellow fever and other fevers also are endemic, are less liable to such diseases than Europeans. During the late epidemic I have seen women and children attacked by the disease, but not in sufficient numbers to enable me to make any statement as to the proportion of sickness and mortality between sexes and ages.

31. I think it more than probable if the locality be unhealthy in which persons are exposed to such contact.

32. By a continuance of malaria, either vegetable or animal. I think yellow fever may be produced in unfavourable states of atmosphere at Bermuda, in crowded and ill-ventilated positions especially.

33. Removal from infected districts, and the separation of large parties of men into smaller bodies, and placing these in different and distant positions from each other. And I would recommend for the future prevention of the disease in Bermuda, that permanent, or even temporary, barracks should be erected, capable of containing comfortably from 100 to 200 men in different elevated positions in the islands.

34. Immediate removal from places where the disease may appear, and in the case of troops, separating and encamping them in different positions.

35. Unanswered.

36. Bermuda is small, has no rivers, and few open swamps, or extensive stagnant waters; is low and well wooded, and all bare or open spots are easily swept clean of malaria by even slight winds. The numbers of Europeans and strangers are comparatively small, and the population is scattered.

37. Unanswered.

38. I think that the troops and convicts should be separated into smaller bodies than hitherto, and that never more than 150 or 200 men should be kept together in any position; that every effort should be made to enforce cleanliness of houses and localities; that the barracks occupied by troops and the convict hulks

Appendix.

Answers of Assistant-Surgeon Munro.

hulks should be so situated that ventilation and drainage could be properly established, and that the space allotted to each man should be considerably greater than that allowed by regulation. I do not affirm that these measures would prevent disease reappearing, but they would certainly tend to modify the character of any disease that might appear.

Are you of opinion that casemate barracks or forts are proper habitations for troops in this climate during the summer months?—Certainly not.

Are you of opininion that the confinement of prisoners on board hulks in the hot months is prejudicial to their health?—If the hulk is in a good position, not over crowded, and well ventilated, I consider it preferable to a prisoner on shore, particularly in a tropical climate.

In your opinion, what amount of space should be allotted each man in a barrack and hospital in this climate?—I am of opinion, that for a proper preservation of health among the troops not less than 600 cubic feet should be allotted to each man in a barrack, and in an hospital at least 800 cubic feet.

(signed) *Wm. Munro*, M. D.,
Assistant Staff Surgeon.

No. 16.

Answers of Assistant-Surgeon *Deeble*.

Answers of Assistant-Surgeon Deeble.

1. I have been seven years and a half as Assistant-Surgeon in Her Majesty's 56th Regiment. I have served four years and five months in Gibraltar, two years and ten months in Bermuda; also in Great Britain.

2. I witnessed one of epidemic cholera in Gibraltar.

3. The first case came under my personal observation on the 15th August 1853.

4. The case originated at Fort Cunningham, the individual was the wife of Private Davis, 56th Regiment; the case terminated fatally in five and a half days, there was no black vomit.

5. I have seen over 200 cases of yellow fever during the late epidemic, and was in medical charge of the Quarantine Hospital, at Port's Island, from the 4th October 1853, to January 1854.

6. That the disease originated in these islands, and was aggravated by a hot and wet summer.

7. No, I think it is not different.

8. I consider yellow fever infectious, and my reason for thinking so is, from the number of persons attacked who were attending the sick.

9. Yellow fever becomes communicable when it assumes a malignant type, in ill-ventilated abodes, and overcrowded hospitals.

10. I am of opinion that it was not imported.

11. I have seen sporadic cases occur in St. George's in December 1852, and January 1853.

12. The ration consists of 1 lb. of bread, and 1 lb. of fresh beef or salt pork daily; salt pork is issued on Monday and Thursday. The cubic space allotted to each man is as follows:—Royal Barracks, 393; Sappers and Miners, 417; Fort Victoria, 350; General Hospital, 545. The sick are treated in hospital. The troops are quartered at St. George's, Hamilton, Ireland, and Boaz Islands.

13. The soldier is susceptible to attacks of fever, from his indulgence in spirituous liquors.

14. The epidemic appears to have confined itself chiefly to Saint George's. The ready access which the soldier has to spirits, compared with that of Ireland Island, is well known to all, and comparative drunkenness consequently.

15. The want of cleanliness in St. George's, and the intermixture of the married soldiers and their families amongst the inhabitants in overcrowded and ill ventilated abodes where they reside. The General Hospital is situated close to the sea on the north shore; it is well ventilated, and capable of accommodating 50 men. The Ordnance Hospital is situated on the west of the town it is a wooden building inconvenient and badly situated, capable of holding 16 men.

16. I was stationed at St. George's, in medical charge of the 56th Regiment and military prison, from January 1853, to April 1853 and was doing the ordinary

Appendix.

Answers of Assistant-Surgeon Deeble.

ordinary duties of assistant surgeon from April up to the 4th September, when I was attacked with the epidemic fever. On the 4th October, I assumed the medical charge of the General Hospital at Port's Island, and continued in charge until January 1854.

17. The soil appears chiefly sand. The town of St. George's is situated in a hollow, surrounded by low hills; on the eastern side, at a little distance from the town, the barracks are situated, surrounded by the forts; the burial ground is in the centre of the town; there are two slaughter-houses in the town; pigs are also kept in the town, and the back yards, lanes, and several of the houses are kept in a most filthy state, enough to engender fever and other diseases.

18. The soil is disposed of at long periods, by digging deep holes where it is deposited. There are no cesspools or drains of any kind.

19. I believe St. George's has always suffered severely from epidemic diseases.

20. Unanswered.

21. The troops were removed to the Ferry on the 13th September.

22 and 23. Unanswered.

24. Some years; her position was bad, being directly under a perpendicular bank, and the inmates deprived of a free circulation of air, and I consider that she was the hot-bed of the late epidemic fever.

25. I consider that remittent fever is.

26. A damp warm wind from the south and east, and a temperature above 70 degrees.

27. I understand that in 1843, there were the same conditions of the atmosphere and winds.

28. The summer was very hot, and more rain fell.

29. Plethoric habit, and Europeans lately arrived from their native land.

30. The inhabitants are more exempt than Europeans, females than males, coloured than white.

31. I believe yellow fever is communicable by direct contact, and by inhaling the miasm conveyed from the patient's body.

32. Yes.

33. Unanswered.

34. The immediate removal of the healthy from the infected locality.

35. The result I believe was salutary.

36. I am not prepared to say.

37. I do not.

38. Unanswered.

Are you of opinion that casemate barracks or forts are proper habitations for trops in this climate during the summer months?—I am of opinion that Fort Victoria is not; and Fort George should only have half the number of men in it that now occupy it, during the hot months, and I consider one half the men should be taken out of the Royal Barracks during the hot months in each year; care should also be taken to avoid having more than one prisoner in each cell at the Military Prison.

Are you of opinion that the confinement of prisoners on board of hulks during the hot months is prejudicial to their healthy condition?—Provided the hulk be moored in an airy situation, and that they are not too crowded on board, I am of opinion that it is not prejudicial to a healthy condition of prisoners being confined on board of them.

(signed) *Wm. Deeble,*
Assistant-Surgeon 56th Regiment.

No. 17.

Answers of W. F. Knox, Esq.

Answers of *F. W. Knox*, Esq., Assistant-Surgeon 56th Regiment.

1. I have been in Her Majesty's service two years and six months; two years and three months, a half of which, were spent in Canada, New Brunswick, and Nova Scotia; the remainder in the Bermudas.

2. I have seen a good deal, and served partially in the cholera epidemic, in Ireland, in the year 1849.

Appendix.

Answers of W. F. Knox, Esq.

3. The first case that came under my observation, in this late epidemic, was that of a man named Clancy, a clarionet player, belonging to the band of the 56th Regiment, at Prospect Hill, on the 2d of November 1853.

4. The case alluded to in the 3d observation, in my opinion originated on the march from the encampment at Ferry Point to that of Prospect Hill, as he was perfectly healthy at the former station. The case terminated fatally, he having sank rapidly from the time of his admission into the General Hospital at Prospect Hill (which was the day after our arrival there); but to the best of my recollection (as I left for Devonshire College in a few days) black vomit did not supervene before death.

5. As to the nature or extent of my practice, it is but limited, having arrived here on the 20th October, at which period the epidemic appeared to be on the decline, and always being placed in that position that I seldom saw how the case terminated, on account of the various changes that I experienced during the prevalence of the epidemic.

6. It appears to me that a case of very doubtful character occurred in the Ordnance Hospital during the month of December 1852, which terminated fatally, and a report of which was made to the acting governer by Dr. Farr, surgeon of the Ordnance department; but I am of opinion that the storm that occurred here on the 20th August 1853, which caused the hulk "Thames" to break some of her moorings, thereby stirring up the filth in which she is imbedded, I believe to the depth of 10 feet, together with the increased heat and moisture, both of which were felt last summer, had a tendency to aggravate the disease, which was one of the most malignant character and generally fatal.

7. I at one time thought that the epidemic might have been imported in some way or other; but on finding that the case I alluded to, that occurred in the Ordnance Hospital, and also one in the hospital of the 56th Regiment (this did not prove fatal) came on long before there was any rumour of the importation, has made me alter my opinion, and leads me to believe that yellow fever is endemic to the islands, but wants some exciting cause to make it an epidemic.

8. From what I saw I do not think it communicable. Some constitutions are more liable to get disease than others; but a great deal depends on the state of the atmosphere.

9. If communicable it may attack those that are living in crowded and badly ventilated dwellings; also those of dissipated habits, the air at the same time being impregnated with the malaria.

10. I am of opinion that the fever was not imported, but originated in these islands, as the case quoted in my sixth remark leads me to this opinion.

11. My opinion on this question is, that the specific miasma indigenous to these islands, together with the influence of the effluvia with which the convict hulk "Thames" must be surrounded, is, under special circumstances, liable to produce yellow fever.

12. Not being here when the epidemic broke out, and being moved so often from place to place as necessity required, that it was impossible to find out the effect in respect to the separation of the sick from the healthy, as also the cubic space allotted to each man. The Ferry encampment, in my opinion, was the most healthy of all the stations.

13. Yes. In my opinion the clothing of the soldier on guard during the day is too warm and heavy for this climate, together with which he is obliged to carry 1 lb. of ammunition, his firelock and belts, weighing 17 lb. 10 oz., and the chaco 1 lb.; altogether making him carry 19 lb. 10 oz. This, I think would be a predisposing cause for fever in the soldier. I also am of opinion that the punishment of heavy marching order drill is too much for a soldier in this climate, he being obliged to carry 27 lb. weight for three hours during the very hottest part of the day.

14. I allude in these particulars to the encampment at Ferry Point, and Ireland island, also to Prospect Hill.

15. The encampment at the Ferry was situated on a kind of peninsula, having one road running through its centre. A guard being placed at either end of the encampment, on the road side, prevented the soldiers communicating with St. George's (which was at that time the most unhealthy place on these islands) thereby rendering it the most eligible place for the troops. The Ordnance Hospital at St. George's is a hired building, and is situated at the

Answers of W. F. Knox, Esq.

south side of the island, and lies to the south-west of the town, down a declivity, and is sheltered from almost all the winds, except those coming directly from the south. The building is in a most dilapidated condition, there not being the space of two beds dry when it rains hard, as is customary in this climate.

16. I arrived at the encampment at Ferry Point on the 20th October 1853, where I remained till the 31st October, on which date the encampment was broken up, and we were ordered to join the encampment at Prospect Hill, where I remained till the 5th November, when I was ordered to Devonshire College; at which place I remained up to the 8th November, when I was sent to Port's Island, where I stayed till the 15th, and then I was ordered to Ireland Island, and on the 6th December left Ireland Island for St. George's.

17. The soil about St. George's is of a rocky description, and as to its acquired properties, I believe it has none. The town of St. George's is situated to the southward of the barracks and the forts, with the exception of Fort George, placed on the side of a hill, the lower street not being more than two or three feet above the level of the sea; there is no drainage whatever that I could make out. The houses, lanes, and back-yards are in a filthy condition, and no means whatever taken in keeping them clean. The tides rise about three feet. There are two burial-grounds, one for the inhabitants directly in the centre of the town; the other, the military, is situated at the back of the barracks, on the north side of the islands.

The slaughter-houses are two in number, and are situated in the north-east end of the town, one of which, kept by Mr. Todd, I was in the habit of visiting occasionally, and found clean at all times, and well ventilated, being devoid of any smell whatever; the second one, kept by Mr. Davenport, is in a dilapidated condition; no cattle have been slaughtered in the latter one for some time back; and on account of the fewness of the troops at St. George's lately, the number of cattle slaughtered per week amounts almost to nothing. I should certainly say that from the situation of St. George's, the dirt of the town, and the narrow and badly ventilated streets, that fever once engendered would be greatly aggravated by those causes.

18. I really cannot say how the night soil is disposed of, or how often the cess-pools, if any, are cleaned.

19. All the former epidemics that occurred on these islands were always attributed to importations, and Europeans suffered much more than the natives.

20. Not being here when the epidemic broke out, and being in so many different places, it was impossible to find out the numbers in each quarter accurately.

21. I believe that the immediate removal of the troops, and encamping of them, were the measures adopted, but I cannot say the date of their removal accurately.

22 and 23. Unanswered.

24. The hulk "Thames," as well as I could learn, has been moored in St. George's Harbour for the last 8 or 10 years, and I am of opinion that the quantity of filth she must be surrounded with, as the current of the tides are not rapid enough to clear it away, would be sure to aggravate the disease, if not to produce it.

25. I am of opinion that bilious remittent fever is endemic to Bermuda, and liable to become an epidemic by any exciting cause.

26. Moist atmosphere and heat, together with winds from the south-east or south-west.

27. None.

28. There scarcely ever has been so hot a summer felt in Bermuda, and never has so much rain fallen, accompanied by thunder and lightning as last summer.

29. The constitutions most predisposed to fever, are those of a sanguine temperament, but fever attacks all classes, and of very different temperaments.

30. Yes, more males are attacked that females, more adults than children, and more white than coloured people.

31. In my opinion, it is not communicable by touching the body either dead or alive, or the articles of dress, or bedding of those attacked.

32. Yes, I do think that yellow fever may be produced in Bermuda by the circumstance quoted in the margin.

Answers of W. F. Knox, Esq.

33. Separating the sick immediately from the healthy, and dividing the troops into various encampments, and keeping up strict quarantine laws.

I would, in the first place, suggest that all the hulks should be anchored out in the channel, and be occasionally moved from place to place within 300 yards up or down the channel. 2dly. I would suggest the propriety of having a floating Military Hospital, well ventilated, for such emergencies as may require it. 3dly. That the soldier in summer should be allowed to mount guard in loose smock frocks, such as they now wear on fatigue duty, merely carrying the bayonet; that they should have straw hats with a high crown, well lined, and having a broad brim served out to them, to protect them from the influence of the sun in the summer.

34. I strongly recommend the floting hospital, and of course to have always a mode of conveyance for the sick to this hospital.

Dividing the regiment into different encampments, not having more than 100 men in each encampment. Also to have a sufficient military medical force on the station in case they may be required.

35. From what I saw, it was attended with beneficial results.

36. This is a difficult question to answer, but in my opinion the seed of the disease is in the islands, and all it wants is, an exciting cause to produce it every year.

37. I could not ascertain the proportion.

38. I have given all the information my limited experienee can suggest towards the present inquiry, and only hope it may prove of the slightest benefit.

(signed) *F. W. Knox*,
Assistant-Surgeon, 56th Regiment.

No. 18.

Answers of *J. Ballingall*, Esq., Naval Storekeeper.

Answers of J. Ballingall, Esq.

1. Upwards of 46 years in the civil service of the Admiralty, in England, Brazil, Canada, Ceylon, and Bermuda.

2. I have experienced former epidemics in Ceylon and in Bermuda, but have only noted the latter. *See* answer to query 8.

3 to 5. Unanswered.

6. My opinion is, that the fever of 1853 originated in Bermuda; that its origin is attributable to the extraordinary heat and moisture of the last summer as compared with other seasons, and that it did not differ (except perhaps in degree) from former epidemics of yellow fever, with which these islands have been visited.

7. That opinion is not different from that which I entertained before the breaking out of this fever in a general form.

8. I think it communicable, and I ground that opinion on the following instances which have come within my knowledge during my service at Bermuda.

The Epidemic of 1837.—On 13 October 1837, Mrs. Lucy Brock, the wife of the then gaolor of Hamilton, died there of fever, and the same evening her body, together with that of her still-born child, was privately brought over to Ireland Island, and placed in a house situated in "The Square," and inhabited by one John Rickards, a smith belonging to the dockyard. The bodies were interred on the evening of the 14th October, and the muster-books of the yard show that within a week from that date about a dozen of the workmen (without reckoning their families) were attacked with sickness. More particularly, out of six convict guards who assisted to carry bodies to the graveyard, three fell victims to the fever; viz., John Strickland, on the 16th October; Charles Wilson, on the 17th October; and Thomas J. Davis, on the 20th October.

The husband of Mrs. Brock was so ill at the time of her death as to be unable to attend the funeral, and likewise died of the fever at Hamilton, the 10th November

Appendix.

Answers of J. Ballingall, Esq.

vember 1837. The deaths of persons resident in and in the vicinity of Rickard's House, were as follows, viz.:

James Torr, mason - - -	died 21 October 1837.
Henry Perrin, labourer - -	died 27 ,, ,,
John Rickards, smith - - -	died 28 ,, ,,
Mrs. Rickards, his wife - -	died 1 Nov. ,,
Mrs. Skinner, wife of a mason -	died 31 Oct. ,,
William Adsley, warder - -	died 9 Nov. ,,

The Epidemic of 1843.—Of a population connected with the Dockyard, of about 444 individuals (men, women, and children), as shown by a census taken in October of that year, 130 were attacked with fever, of whom 11 died, and eight of these deaths occurred in houses contiguous to or in the near neighbourhood of each other. At the Naval Hospital 1,210 fever patients were admitted between the 3d August and the 4th December, of whom 110 died between the 5th August and the 17th November. The medical staff then established at, or temporarily attached to, the hospital, consisted of one deputy inspector, two surgeons, and seven assistant-surgeons, Royal Navy, out of whom three of the latter were dangerously attacked with fever, but fortunately not fatally. These officers, doubtless, had the disease communicated to them whilst in attendance on the sick. Another case in point, and which occurred in 1843, is that of Governor Reid, who, I remember, having expressed a wish to be shown some patients in the last stage of the disease, was, by Dr. Gilbert King, the then deputy-inspector of the hospital, after some remonstrance, taken to the bedside of a patient who was almost at the point of death, and who I believe died before Colonel Reid left the hospital. The latter went home, and very shortly after was attacked with fever, and everyone who was then resident in Bermuda knows how long and dangerously ill he was. It is reasonable to suppose that he caught the disease in the visit to the Naval Hospital just mentioned.

The Epidemic of 1853.—The population connected with the Dockyard, and resident upon Ireland Island, taken by census in December last (and as shown in the Appendix, No. 2, dated 31 December 1853), amounted to 419 souls, men, women, and children. Of this number 29 were attacked with fever, but fortunately no death occurred. At the Naval Hospital 137 fever patients were admitted between the 28th August and the 26th December, most of whom, I understand, were soldiers belonging to the several corps in garrison in the colony. The first of these cases from the military were three patients, received on the 28th August from the Military Hospital at St. George's; at which period, be it remarked, Ireland Island and the Naval Hospital were comparatively healthy and free from fever. Of the number of admitted fever patients, 38 died between the 15th September and the 9th December, during which period also died of fever the European persons belonging to the service of the hospital. Several of the native coloured nurses were attacked with fever, but not fatally. During the prevalence of the disease the medical staff permanently or temporarily attached to the Naval Hospital consisted of one deputy-inspector and six naval assistant-surgeons, of whom the deputy-inspector and three of the assistant-surgeons were seized with fever, fortunately again not fatally, although three of the latter were dangerously ill. Contact with the patients may here also be reasonably assigned as the originating cause of the disease in these gentlemen, as well as in those who died, and in the nurses.

In further illustration of the point, may be adduced the melancholy cases of the daughters of Captain Jervis, R.N., the deputy-superintendent of the convict establishment, and of the attendants on their deathbeds.

Miss Martha Jervis, the elder daughter, died of fever at Boaz Island, on the 25th October 1853. The men who were about the house, and in immediate attendance on her, were—

H. Hazel, taken sick the day following her death, but recovered.

George Blinkworth, taken ill the 27th October, and died the 1st November 1853.

John Percival, taken ill the 31st October, and died the 4th November 1853.

Alexander Elder, taken sick the 1st, and died the 7th November 1853.

Ann Willcox, a European servant in Captain Jervis's family, and who was also in close attendance on Miss Jervis, was attacked the day she died, but recovered after a long and severe illness.

Miss Fanny Jervis, the younger daughter, died of fever at Mrs. Black's cottage, at Spanish Point, the 21st November 1853. Charles Bond, a mate or quartermaster in the convict service, who had been in close attendance on that young lady during the most part of her illness, was brought over to Boaz Island about three hours before her death, in a high state of fever, and deranged in mind, but he recovered.

These various instances, in my opinion, prove, almost beyond a doubt, that yellow fever is communicable.

9. By actual contact with a person labouring under the disease; by touching the corpse of one dead of it, or by handling the clothes or bedding of either; also from entering the neighbourhood, house, or room, where yellow fever exists or has prevailed.

10. I am of opinion that the fever was not imported.

11. Yes, under special circumstances.

12 to 14. Unanswered.

15. The military barracks at Ireland Island appear to be healthily situated, but the privy attached to them, and referred to in the report of the officers of the Naval department, on the sanitary condition of Ireland Island, and hereto appended, seems to be susceptible of improvement, and is accordingly, it is understood, either in the course of being or about to be altered and reconstructed by the Ordnance department. With the exception of defective ventilation, the naval hospital at Ireland Island is believed to be generally eligible for all required purposes.

16. Continuous residence upon Ireland Island since January 1831, and in the appointment I now hold.

17. In applying this question to Ireland Island, I append a copy of a report by the officers of the naval department, and dated 12th September 1853, which will give full information regarding the means of drainage, and the precautions there adopted to keep the houses and their localities clean.

18 to 20. Unanswered.

21. See copy Report, referred to in answer to question 17.

22 and 23. Unanswered.

24. Since June 1844. Berthed in her present position in October of that year; this was the same as that formerly occupied by the "Antelope," which latter vessel was the first convict hulk stationed at St. George's, whither she was conveyed from the Dockyard in September 1833, and where she remained until October 1844, when she was brought back to the Naval Yard, and broken up. Both ships were secured in their berth, aground on the beach, for the convenience of sending the convicts with facility to and from their work, and until the breaking out of the epidemic of 1853 I never heard of the situation being an unhealthy one. At any rate, I am certain that until the period just referred to, no official request was ever made to me to have either of the hulks removed on that account. The "Thames" is now about to be shifted from the position she has so long occupied.

25. No; so far as I am aware.

26 & 27. Unanswered.

28. The temperature of the summer of 1853 was higher, and more rain fell during the hot weather, than is usually the case during the same season.

29 & 30. Unanswered.

31. Yes. See my answers to questions 8 and 9.

32. Yes; from both.

33. Briefly, public and domestic cleanliness; and particularly the latter, which would in a great measure carry the former with it. Improved drainage, sewerage, and ventilation are also highly desirable; and in my opinion there is still very great room for improvement in this respect throughout the Bermudas.

34. Parochial hospitals for the reception of the poorer classes of the community who may be seized with fever, with medical men, nurses, &c., attached to them, paid by the public; the dispersion, as much as may be practicable, of the troops and other large and congregated bodies of men; the restriction of all unnecessary intercourse with infected districts; the appointment of local boards of health delegated with sufficient powers for the thorough cleansing and purifying the different streets, lanes, courtyards, drains, privies, &c.; and also for taking such other measures as they may consider necessary for the public health.

35. I consider that separating the troops at Ireland Island tended to arrest the spread of the disease there in 1853.

Appendix.

Answers of J. Ballingall, Esq.

36. The general nature of the climate during the summer season at Bermuda does not appear to be favourable to the generation of yellow fever. This seems to be the reason why that disease appears so seldom in Bermuda.

37. No.

38. No. I think I have in my preceding answers given all the information of which I am possessed.

(signed) *J. Ballingall,*
Naval Storekeeper.

Her Majesty's Naval Yard, Bermuda,
13 January 1854.

(No. 1.)

MINUTES of an Examination into the Sanitary Condition of *Ireland Island,* on 2d September 1853, and following Days, by the Naval Storekeeper, Deputy Inspector of Hospitals, and Clerk of the Works.

THE state of the public health appearing to render a strict inspection of the sanitary condition of Ireland Island necessary, the undersigned have to remark as follows:

1. Contiguous to the dockyard, we found an open drain leading from the barrack privy to the sea, which did not appear to have been cleared for a considerable time, and contained a large quantity of night-soil. From this source, and from the large shaft connecting the privy with the drain, we found highly noisome and deleterious gases being evolved, contaminating the atmosphere. We consider it necessary that measures to clear the soil and to prevent its further accumulation in the drain be immediately taken; and further, that the plan of carrying off the soil from the privy be so altered as to prevent its being, as it now is, a receptacle for the formation and dispersion of these unwholesome effluvia.

2. Also contiguous to the dockyard, and diffusing an unhealthy atmosphere, is a temporary privy in use by the convicts employed on the works. It appearing that this privy could be moved to where it would no longer be objectionable, by reason of placing it over deeper water, its immediate removal was ordered.

3. Rows Nos. 3 and 4, mechanics' houses on the glacis, being nine dwellings.

The water in nearly all the tanks was found impregnated with sulphuretted hydrogen gas, and was only used by the inmates for culinary purposes or for washing, the water for drinking being procured from other sources.

This result appeared to be owing to part of the catch for the rain being roofs of shingle, constructed subsequently to the erection of the houses (the roofs of which are of slate), portions of the shingle being washed into the tanks, decomposed, and, with other deposits, produce the offensive gas. The tanks were also too close to the houses and to the privies, and thus receive impurities which affect the water. These houses were constructed in 1818, and being on the glacis, were ordered by their Lordships to be removed as soon as practicable. Permanent alterations seem therefore inadmissible, but we directed lime-shell to be put in the water to purify it, and various repairs to drains, &c., to be at once executed, and the whole interiors to be whitewashed.

4. Range No. 1, mechanics' houses on glacis, being four quarters. A wood building constructed in 1814. Two tanks were found under the rooms of this building, covered only by the naked flooring, and with no ventilation between the floor and the water. Sulphuretted hydrogen was escaping, and our attention was called to this by the assistant-surgeon, who had at this time a patient in one of these rooms. It appeared that dirty water spilt on the floors could get into the tanks, and the water was collected from shingle roofs.

The arrangement of tanks under such floors appears bad; we ordered the tanks to be cleared out, whitewashed, and ventilators cut into them, so as to prevent accumulation of foul air and moisture. It also appeared that this and an adjoining building were overcrowded, and five families were ordered to be removed from the island in consequence, and in default of other accommodation, the families being those of guards of the convict department required constantly on the works, and provided with quarters under the Commander-in-Chief's order of 15th May 1849, at rents of 2*s.* per week each.

5. Ranges Nos. 2 and 4, mechanics' houses on glacis, being nine quarters. Wood buildings constructed in 1814. In a very dilapidated state, open to the weather from decay in some parts, and probably unhealthy from decomposing wood. Condemned as not reparable in 1852; but, owing to want of quarters, patched up and occupied, as reported to Commander-in-Chief, under date 21st May 1853.

6. Private store and buildings, occupied by Mr. Darrell. Parts very dilapidated; much dirt lying about; two tanks in a filthy state; decomposing wood on different parts of the premises; ordered immediately to be cleaned and repaired, or where not reparable to be removed.

7. Adjoining Cockburn's Cut, our attention was called to the neighbourhood of the quarters occupied by married people of the regiment in garrison. We perceived various dilapidated huts, constructed of loose stone, and used as washhouses; much dirt and filth lying about, with small pools of stagnant water, producing a deleterious effect on the atmosphere. It appears neccessary that the proper authorities be communicated with, so that the nuisances above enumerated, and which tend to affect the general health, be done away with.

Answers of J. Ballingall, Esq.

8. Spar Yard. The tank and cesspit to the privy of the warder's cottage in this yard, constructed in 1828, are only separated by a thin wall, and we found the water in the tank to be affected by the percolation from the privy. The privy is also too near the house. It appears necessary that another privy be constructed at a greater distance from the cottage, and that the tank be thoroughly cleaned, purified, and cemented. The ventilation of this cottage is interfered with by the old tank-house, a condemned building, and not used, and by a private workshop put up against it. We ordered both to be removed.

9. Cottages near Spar Yard, 10 in number. The water of five (from the shingled roofs) was complained of, and not used for drinking. That from the slate roofs of the remaining five was good. Ventilation appears to be required between the tanks and the naked flooring of the rooms over, which forms their covering, as adverted to under paragraph 4. Some trees were ordered to be cut down to obtain better ventilation, and some temporary erections attached to one cottage to be removed. One cottage in the occupation of the Commissariat department we found dirty, and consider a representation to the officers of that department necessary.

10. Six dwellings at Lodge Point were dirty and in bad order. The occupants were ordered to put them in proper order forthwith.

11. Several pigstyes were directed to be removed forthwith, and the keeping of pigs prohibited.

12. We ordered chloride of zinc to be used in various offensive privies, and certain drains, which, from the want of water, have become in some degree merely elongated cesspools, to be flushed by means of a proper apparatus forthwith.

13. Generally we would remark that we consider it desirable that Ranges 2 and 4 should cease to be made use of as quarters as soon as possible. That naked flooring, forming the floor of a room and covering to a tank, as in various buildings named, and as at the officers' quarters, and two other quarters at the Royal Naval Hospital, is objectionable, and that brick or stone arches may with advantage be substituted. That as soon as practicable the collection of water from roofs covered with shingles be done away with, by using other descriptions of covering. That means of ventilation be applied to all tanks, and between all ground floors and the ground beneath, so as to prevent the accumulation of deleterious gases and damp. That such drains as those adverted to under paragraph 12 be periodically flushed, in order to prevent accumulation of soil. That, if possible, a means be supplied of a constant supply of water to all privies or closets to the workmen's dwellings; that these should (having such supply) be provided with earthen pans, instead of remaining, as at present, open privies, and that further cesspits be done away with, and that tubular drains of proper size be laid down from the buildings to the sea wherever practicable.

Given under our hands this 12th day of September 1853, at Her Majesty's Naval Yard, Bermuda.

(signed) *J. Ballingall*, Naval Storekeeper.
E. Hilditch, Deputy Inspector of Hospitals.
J. D. Anderson, Clerk of the Works.

In submitting the foregoing report to the Vice-admiral the Commander-in-Chief, the naval storekeeper has to represent, with reference to paragraph No. 1, That a communication has been addressed to the respective officers of Ordnance; they replied by letter of the 6th instant, that orders had been given to the proper officer to remedy the nuisance complained of.

No. 4. That the convict officers occupying these houses had, on the 3d instant, notice given them to quit, and to remove their families off the Island within 14 days.

No. 7. Verbal communication had with the military authorities, and orders given to remove the nuisance complained of.

No. 9. Verbal representation made to the proper Ordnance authorities, and the nuisance complained of ordered to be remedied.

Generally. The other sanitary measures recommended are being simultaneously carried into effect with all the practicable despatch afforded by the resources at the disposal of this department.

(signed) *J. Ballingall*,
Naval Storekeeper.

Bermuda Yard, 12 September 1853.

My dear Colonel Oakeley, Monday, 27 March 1854.

During the stay of the French frigate "L'Armide," in August 1852, neither bedding, blankets, nor any other stores whatever, were provided from the dockyard; consequently no articles of the description you mention could have been returned to me; and I had no further transactions in that matter than by finding the means of assistance in the transport of the sick from Murray's Anchorage to Port's Island, and by defraying the expenses incurred in the colony on account of the French Government. But when Port's Island was put in requisition for the reception of their sick, the island was placed at the immediate disposal of our naval hospital, and therefore, in all probability, Dr. Hilditch might be enabled to give the information you require.

Yours, &c.
(signed) *J. Ballingall.*

Appendix.

Answers of J. Ballingall, Esq.

(No. 2.)

A Schedule of the Number of Officers and Men belonging to the Establishment of this Yard, and employed on the New Works of this Department, and of the Women, Children, and Servants composing their Families, and resident upon *Ireland Island* during the prevalence of Yellow Fever, between the 1st August and the 31st December 1853, distinguishing Europeans from Natives, and also showing the Number attacked with Fever during that Period, &c. (exclusive of the Naval Hospital Establishment); viz.

	MEN.			WOMEN.			CHILDREN.														SERVANTS.												Total.
	European.	Native.		European.	Native.		European.				Native.										European.		Native.										
							Over 14 Years.		Under 14 Years.		Over 14 Years.				Under 14 Years.								Over 14 Years.				Under 14 Years.				
											Males.		Females.		Males.		Females.						Males.		Females.		Males.		Females.		
		White.	Coloured.		White.	Coloured.	Males.	Females.	Males.	Females.	White.	Coloured.	White.	Coloured.	White.	Coloured.	White.	Coloured.			Males.	Females.	White.	Coloured.	White.	Coloured.	White.	Coloured.	White.	Coloured.	
Number - - - -	62	20	72	32	26	8	–	1	6	8	6	4	8	2	56	9	61	8			–	2	–	6	–	17	2	1	1	1	419
Of which number have been afflicted with fever between the 1st August and the 31st December 1853 - - -	4	3	4	7	3	1	–	–	–	–	–	–	–	–	4	–	2	–			–	–	–	1	–	–	–	–	–	–	29
Number of deaths by fever between the 1st August and the 31st December 1853 - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–			–	–	–	–	–	–	–	–	–	–	Nil.

Bermuda Yard, 31 December 1853.

J. Ballingall, Naval Storekeeper.

No. 19.

ANSWERS of *John D. Anderson*, Esq., Civil Engineer.

Answers of John D. Anderson, Esq.

1. I AM a civil engineer, in the employment of the Lords Commissioners of the Admiralty; I have been so since 1841, serving in Her Majesty's naval yards at Portsmouth, Gibraltar, and Malta; at Bermuda since 1847, and in charge of the naval works, on which about 20 Europeans, 40 Bermudians, and an average of 600 convicts are employed. In 1852-53, I was on special service at Port Royal, Jamaica, and at Antigua, reporting on the naval works at those places.

2. I visited the United States and Canada during the cholera epidemic of 1849, and paid attention to the sanitary condition of New York, Philadelphia, Buffalo, Montreal, and other places. It appeared that where sewerage was defective, where cesspits and privies were in common use, where filth accumulated, where deposits of animal and vegetable matter lay on the shores of lakes and rivers, exposed to heat and damp, in all such places the epidemic was felt with unusual severity.

In January of this year I was twice at the Danish island of St. Thomas, remaining on one occasion three days; yellow fever then prevailed, and particularly in the steam vessels and coal ships of the British Royal Mail Company. I examined the locality at which these ships coaled; it is confined, and under a cliff, so that there is little circulation of air in the neighbourhood of a marsh; and owing to its position with reference to the prevailing winds, much of the filth that floats from vessels in the harbour finds its way to it. Piling in front of the shore forms the wharves; under and between the piles, and on the shore, the above-mentioned filth lodges, together with that arising from 200 to 300 negroes employed in coaling; and it appeared that vessels which lay at this place generally contracted fever. The "Bermuda" steamer, which visited St. Thomas's once in each month, lying there for several days on each occasion, but not at this wharf, and which had done so during the whole period of the epidemic, had not had fever on board of her.

3 to 11. Unanswered.

12. Having had to fit up a building in the naval yard as a temporary barrack for 80 men, on the breaking out of the epidemic to which this inquiry refers, I made it my business to ascertain the cubic space allotted to each soldier in the casemate barracks at Ireland Island, intending thereby to be guided. On the ground floor of these barracks, I found that each soldier was allowed nearly 290 cubic feet, and on the upper floor rather more. Considering this amount entirely inadequate, I allowed 600 cubic feet to each man, having ample means for ventilation besides, in which the casemate barracks are very deficient. I would add, that I perceived in these barracks that each alternate room on the upper floor had a well-hole and staircase communicating with the room below; and by this means, I consider that the exhalations from the bodies of the men on the ground floor ascend and contaminate the atmosphere of the rooms above.

It might be interesting to ascertain whether the fever was more or less prevalent in the upper or lower rooms, as the staircases could readily be moved outside, and the well-holes closed.

Having three guardhouses under my charge, as part of the naval works, and perceiving that soldiers generally keep all the usual openings for the admission of fresh air closed, in these guardhouses, I would remark, care has been taken to secure ventilation by other means than by doors and windows; and inquiry might show that advantages would result from applying such principle to barracks generally.

Regarding the locality occupied by the troops at Ireland Island, I consider that the barrack privy, which accommodates a garrison of about 300 men, must exercise a bad influence upon its sanitary condition. A hollow shaft, about 50 feet high, and averaging about 24 feet by 4, or 96 superficial feet of section, conducts the soil from the top of the rampart to an open ditch leading to the sea. The shaft is always filled with the most noisome gases, continually escaping, and the ditch with the decomposing soil. The whole surrounding atmosphere is affected, and that not only as regards the barracks, but as regards part of the naval

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naval yard. In September last I was obliged, from this cause, to vacate a building temporarily used by me as an office for the preceding six weeks.

13 & 14. Unanswered.

15. Respecting the first part of this question, I would refer to that part of my answer to question 12 relative to the barrack privy, mentioning at the same time the officers' privy, attached to the same barracks, and its cesspit. With reference to the second part of the question, the royal naval hospital at Ireland Island is one of the works under my charge. It stands on a height about 50 feet above low-water level, with free access to the winds from all sides. In a basement are store-rooms, and over it is the first floor, 62½ feet above low-water level, comprising two wards, each 49 ¼ feet by 24 ½ feet and 12 ½ feet high. On the second floor are two wards of equal size, but only 10½ feet high. This accommodation is supposed to be sufficient for 80 patients, giving about 760 cubic feet in the lower and about 640 in the upper wards to each. Wide halls separate the wards, and a spacious verandah to each floor surrounds the whole building.

In 1849 a system of privies and cesspits which had been in use was discontinued, and waterclosets with proper sewerage to the sea substituted. This has been found a great improvement in a sanitary point of view. The ventilation has been paid great attention to, but as in summer, when it is required to be most efficient, and when an epidemic is most likely to fill the hospital, dead calms and great dampness of atmosphere frequently prevail, I am of opinion that in it and all similar buildings requiring frequent and rapid changes of their atmosphere, in this climate it is necessary to use artificial heat, with a proper arrangement of flues, as a means of inducing currents of air; those occasioned by natural causes then failing, as has proved to be the case in this hospital, when from the want of such currents foul air is not carried off. Ventilation in the climate of the Bermudas I consider more difficult than at Jamaica or elsewhere within the tropics. The constant heat and dryness there vaporise, draw up, and tend to the dispersion of foul air; while at Bermuda, with less heat, much damp, and frequent calms, exhalations hang on the surface and gently spread over it.

In such a climate I would also give my opinion that all barracks and buildings similarly occupied should be vacated for from four to six weeks every summer, to admit of their thorough purification from human exhalations, which experience has shown hang in such places, and are not dislodged by ordinary cleansings.

16. At the naval establishments, Ireland Island, since May 1847, and during the whole of 1853, excepting the month of January, when in the West Indies. *See* Answer to Question 1.

17. I will particularly refer to Ireland Island; it is partly formed of limestone of a crystalline character, partly of a limestone formed by an aggregation of comminuted shells and corals, partly of a calcareous sand, and partly of a red argillaceous earth. There is little vegetable mould. Where not cleared, it is covered with cedar trees (*Juniperus Bermudiana*), similarly to the other islands. The dwellings are generally pretty well scattered, and in airy situations. The barracks are detached from the parts occupied by the civilians of the naval department.

The surface drainage is good, but cesspits, to be immediately done away with, in the naval department, are in use instead of proper sewerage, which is to be substituted.

The whole island is the property of the Crown, and, with the exception of the barracks, of the naval department, and strict regulations are in constant force in the naval establishments as to the preservation of cleanliness.

The rise and fall of tide is at springs nearly four feet, and at neaps about two feet six inches. The shores being left uncovered at low water, and when deposits lie upon them, sometimes occasions noxious effluvia, but such deposits are always immediately removed.

A lagoon which communicates with the sea has, from various peculiar circumstances, been considered to produce malaria at times. By a second communication with the ocean, now being cut, it is believed that an improvement will be effected, as there will then be nearly a constant current of the sea through it.

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The burial-ground is considered to be too close to certain of the dwellings, and it is a fact deserving of record that most of the cases of fever which this year occurred were in houses not more than from 100 to 250 yards from it, and to leeward with the prevailing winds. The light calcareous nature of the soil permits of the free extrication of the gases arising during decomposition.

As regards the towns of Hamilton and Saint George's, I am to some extent familiar with their sanitary state.

At Hamilton surface drainage has been paid some attention to, but there are no sewers, and the use of cesspits is universal. There are from 400 to 420 houses in the town, with a population of about 1,900, or averaging four and a half persons to each house. The houses are of a fair description, generally having two floors, with stone walls, and roofs of the same, sawn into slabs and laid as slates; but many, even the best, are objectionable by reason of the ground-floors being laid nearly level with the ground, and with no ventilation underneath. On the subject of the salubrity of such ground-floors in the climate of Jamaica, I would here give the opinion of Dr. Watson, now deputy-inspector of the Royal Naval Hospital at Port Royal, as expressed in a letter addressed to me in November 1852. Dr. Watson says, "I have no hesitation in denouncing as prejudicial to health and extremely dangerous to life, in this place, the occupation of all ground-floor residences." He had been eight and a half years at Port Royal. As, to keep the houses and particularly the roofs water-tight, it is necessary to whitewash the outside about once a year, this is usually done. Each house is generally provided with a tank for the storage of rain-water.

There are three or four wells in the town, but the water is only used by the poorest classes, its quality being indifferent. The cesspits in use are commonly from 15 to 20 feet in depth, and are never cleaned out. Some, however, are shallow, and are cleaned once a year; and there are persons who let the soil fall on the surface, and when it becomes offensive bury it in holes in their yards or gardens. Lime seems to be frequently put into the pits. Dirty and waste water is generally thrown into the back-yards, where I have also occasionally seen considerable accumulation of rubbish and dirt; but, on the whole, Hamilton may be considered as tolerably cleanly, except as regards the disposal of the soil. Its streets are wide and well disposed for ventilation; the site is good, and admits of easy drainage to the sea. The marshes to the north are undoubtedly unhealthy, but, probably owing to the direction of the prevailing winds, bad results from this cause have not as yet been apparent. Should, however, the town be extended further towards these marshes, I would be very apprehensive of bad consequences.

At the head of the creek forming Hamilton Harbour extensive deposits are being formed by the washing down of earth and other matters. From the banks thus formed, offensive exhalations arise when they are bared at low water; and I think the removal of such deposits, or the conversion of the portion which is laid dry at low water into land above the influence of the tide, and the taking means to prevent further deposits, may well be considered subjects deserving serious consideration, and that before the evil becomes more extensive.

At St. George's neither drainage nor sewerage have received attention. The population is about 1,440, with about 220 dwellings, or averaging six and a half to each. These dwellings, though of the same description, are generally inferior to those of Hamilton; and it will be perceived, from the preceding figures, that the population is also more crowded, in the proportion of six and a half to four and a half. Part of the town lies but little above water level, and a considerable portion is built in a sort of basin rising on three sides of this low part, said to be chiefly made ground. Many of the streets are mere lanes, and the town is generally confined and deficient in ventilation. Cesspits are used, but much soil is deposited on the surface in all directions.

Waterbuts, which are seldom seen at Hamilton, are not very uncommon at St. George's, and in their neighbourhood rank vegetation is frequently to be seen. Many of the houses are without tanks, and the water from two or three wells (of which the water, like that at Hamilton, is indifferent) is used by many of the poorer classes. The general state of St. George's is by no means satisfactory in a sanitary point of view. Efficient means of drainage and sewerage to the sea might be adopted. The graveyard is in the too close vicinity of dwellings, and it is understood to be very crowded.

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Generally I would remark, on the use of cesspits in those towns, that during heavy rains much deleterious gas must be forced suddenly out of them, thereby rendering the atmosphere noxious, while there must at all times be more or less of it evolved, causing the same mischief, but in a less degree.

It may also be observed, that as time passes and as the towns become larger, the strata on which they stand will by percolation get impregnated with night-soil, and so will become huge cesspits, from which the action of rain, damp, and heat will continually evolve a constantly increasing amount of deleterious gases.

The action on the few wells that exist is necessarily prejudicial, and will become more so.

18. *See* Answer to Question 17.

19 & 20. Unanswered.

21. The principal officers of the naval departments, on 2d September, or immediately that yellow fever was understood to be in the colony, and on following days, made a house-to-house visitation in Ireland Island, and the most active measures were adopted for extra cleaning, flushing, and ventilation, for the diminution of the number of persons in apparently overcrowded dwellings, and for all such other precautions as experience had shown to be advisable. These measures were continued during the prevalence of the epidemic, when or where required, as ascertained by constant supervision. Intimation was given to the Ordnance officers of the unhealthy state of the barrack privy, adverted to in answers to Questions 12 and 15, and to the officer commanding the troops, of the unhealthy state of the quarters occupied by married people of the 56th regiment. A great proportion of the last-mentioned were then moved from these quarters and put under canvas, the quarters being considered unfit for their occupation, and the nuisances in that neighbourhood were removed.

On 19th, 20th, and 21st September, the naval officers communicated to the convict authorities their joint opinion that the "Medway" convict hulk, having on board about 600 men, and which lay in a comparatively ill-ventilated angle of the basin, and the effluvium from which was pervading certain of the naval dwellings, the casemate barracks, and part of the dockyard, should be removed to moorings in Grassy Bay, about half a mile from the shore. This was agreed to on 21st, and the hulk was got out on 2d October. This left only one hulk, having on board about 260 men, in the basin, and she lay in an airy part of it, and no effluvium from her reached the dwellings or barracks.

On 22d and 23d September the naval officers put at the disposal of the officer commanding the troops the upper floor of a large airy building, capable of containing 80 men, with 600 cubic feet of space per man, so as to enable that number of men to be removed from the overcrowded casemate barracks, and on the 27th, the necessary fittings having been completed, the troop soccupied the building.

On 23d October, the atmosphere round the naval hospital appearing to be to some extent contaminated, hot lime was on 24th and succeeding days used in the neighbourhood, and with apparently good effect.

In cases of illness, chloride of zinc was used in the dwellings to purify the atmosphere, the dwellings themselves, and clothing.

Lime was used in the graveyard, the graves dug six feet deep, and filled in with argillaceous earth as much as possible, instead of with calcareous sand, as usual. This to prevent as much as possible the escape of deleterious gases. The graveyard was also enlarged, with the view of leaving more space between the graves, so as to diminish the probability of the escape of such gases.

22. From 1st June to 30th September, the convicts are on the works from seven till 11 A.M., and from 2 to 6 P.M. From 1st October to 31st May they are on the works from 7½ A.M. till noon, and from 1½ to 5 P.M. In summer it will be observed that for three hours during the heat of the day they are not at work, an arrangement which doubtless tends to their preservation in comparative health. While on the works they are employed as carpenters, painters, blacksmiths, masons (stonecutters and builders), quarrymen, paviors, excavators, lime-burners, and labourers. The health of the quarrymen, whose work is the most severe, and who are necessarily most exposed to the sun, suffered most during the epidemic of this year.

23. Unanswered.

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23. Unanswered.

24. I am familiar with the position of the "Thames;" she lies aground on a shoal, except at extraordinary spring-tides, when she floats, under and to the south of a high bank. The sun has in that position immense power, and it is not one favourable for ventilation. The neighbouring shores and shoal on which she lies receive various offensive deposits. The prevailing winds carry the effluvia from such, and from the hulk, up the bank and towards the Royal Barracks. I consider her position a bad one in a sanitary point of view, both as regards the health of the crew, and as regards the health of the occupants of the Royal Barracks.

25 & 26. Unanswered.

27. I have not. *See* Answer to Question 28.

28. I beg to lay before the Commissioners Tables, marked 1, 2, 3, and 4, showing various particulars respecting the fall of rain, the temperature, the direction of the wind, and the number of days of calms, or comparative calms, during the whole or part of 1853, comparing the same with similar particulars for 1852, and the amount of rain with that observed by Captain Page between 1836 and 1839. The amount of rain in 1852 and 1853 was recorded by myself; the other particulars are taken from the register of the centre signal station, as published in the "Royal Gazette." I would state that, having been stationed at Bermuda since May 1847, I consider 1852 to have been an average year as to temperature and other meteorological particulars, and therefore a fair standard of comparison. By these tables, I think it will appear that more rain fell in July 1853 than usual, accompanied by frequent and unusual calms and a predominance of southerly winds; also that the temperature remained above its ordinary point to a later period. The heavy rains of July would, I consider, drive much foul air from cesspits and such places, and would, with the usual high temperature, cause great and probably unusual decomposition of animal deposits; also of vegetable matter in the lagoons and marshes. The malarious atmosphere thus generated, owing to the continued calms, would there remain comparatively undisturbed, accumulate, and spread itself. A continuance of southerly winds is well known to produce here a depressed state of the bodily and mental functions, and on the system thus probably disposed to receive its influence the malarious atmosphere would no doubt act. The unusual very heavy gales and amount of rain in November and December of 1853 further mark it as an exceptional year with reference to meteorological phenomena.

Respecting extraordinary atmospheric or other influences being perceptible previous to the acknowledged breaking out of fever in the epidemic form, I beg leave to lay before the Commissioners, Tables, marked 6 and 7, showing the amount of sickness among negroes and mulattoes employed on the naval works; also among convicts of the same department from April to August inclusive, for 1852 and 1853. It will, I think, appear that from April till the acknowledged breaking out of the epidemic fever, sickness to a greater extent than usual prevailed among the classes of persons to whom these tables refer. I consider that the return for 1852 exhibits about the average amount of sickness. In May 1853, the amount of sickness among the convicts (being those of the "Medway" hulk) appeared to me so unusual, that I noticed it in my monthly report of work executed by the convicts, and continued to do so in the succeeding months. I also then, or shortly after, called the attention of three medical gentlemen of standing to this state of matters, and to the fact of unusual sickness among negroes and mulattoes.

29 to 32. Unanswered.

33. The actual cause of yellow fever being yet, as far as I am aware, undiscovered, my own experience has nevertheless shown me that it, like cholera, takes its victims chiefly from amidst filth, dirt, and damp, from overcrowded and ill-ventilated dwellings and barracks reeking with the pent-up exhalations of those who inhabit them, from the neighbourhood of marshes, lagoons, stagnant pools of water, cesspits, or where vegetable and animal matters are undergoing putrefaction and evolving noisome gases; and it may therefore, I think, be reasonably inferred, that if these influences be removed or modified, a visitation

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of yellow fever may have to count those it has destroyed by tens, instead of hundreds.

The active sanitary measures followed at Ireland Island, as described in answering question 21, and which had for their object the removal or modification of any such influences as have been above adverted to, were, under Providence, found efficacious, and in Table 5 will be found various particulars in elucidation.

It is a striking fact, that while in 1843, when the population was nearly twice as much crowded, in an inferior description of dwellings, and with sanitary measures less understood and attended to, the cases of fever and deaths were 36·54 and 2·5 per cent. of the population respectively, in 1853, with nearly the same amount of population, but with that population better situated in all respects in a sanitary point of view, the cases were seven per cent. only, and the deaths none.

Bearing all these results in mind, as well as those elsewhere brought under my notice, with deference I would submit, as points worthy of consideration, the allowing to each soldier at least 600 cubic feet of space in his barracks; the proper ventilation of barracks by means other than doors and windows, and those to be, if possible, beyond the control of the occupants.

The conversion of such privies as those adverted to in answering 12 and 15 into proper closets, with a proper system of sewerage, as applied to the Royal Naval Hospital in 1849, and described in answering 15.

The vacation of all barracks for from four to six weeks in each summer, with the view of their complete purification.

The application of a proper system of drainage and sewerage to the towns of Hamilton and St. George's, and the doing away with cesspits.

The enactment of proper municipal regulations respecting the levels on which to build, and the proper and healthy construction of all dwellings in these towns, and respecting the preservation of cleanliness at all times. Also, respecting the construction of a proper water tank to each dwelling.

The ceasing to use the present burial-ground in the town of St. George's, and the substitution of a site more removed from dwellings.

The removal of the banks dry at low water at the head of Hamilton Harbour, or their conversion into land above tidal influence, as adverted to in answer 17.

The repair of the sluices to the Pembroke marshes, now inoperative, and which permit a pernicious mixture of salt and fresh water, by which mixture the animal and vegetable life proper to each is commonly destroyed, forming deposits of matter which decompose and evolve deleterious gases.

The forming of proper drains under embanked roads, so that ponds of stagnant water shall not be formed, or surface water prevented from discharging itself according to the natural drainage of the surrounding district.

The ceasing to use the present burial-ground at Ireland Island, and the substitution of a site more remote from dwellings.

The removal of the "Thames" convict hulk from her present position in St. George's Harbour.

The ceasing to break up the old convict hulks in the Naval Yard. On this subject some observations will be made in answering 38.

34. The measures taken in the naval department, as described in answering 21, indicate generally measures that were found to be efficatious. The immediate dispersion of men to other localities than those in which they were attacked, these localities being properly chosen, evidently exercises a most powerful influence in checking fever.

35. Unanswered.

36. With deference I offer one or two remarks that may bear on the question, but without attempting to answer it. When yellow fever has heretofore appeared, barracks have been vacated and completely purified, towns and dwellings cleaned, and accumulations of dirt and filth removed, the state of cesspits looked to, and general attention paid to sanitary measures. In a year or two the events that led to such measures are almost forgotten, another set of executive officers and other corps arrive from England or elsewhere. Yellow fever is to all these, generally speaking, merely a name, little more, and the recommendations

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mendations of those who have experienced that it is something more are lost sight of. The municipal authorities and natives, to some extent, forget also, and altogether sanitary measures and precautions receive less and less attention.

Under these circumstances, should atmospheric influences tend to disease, as I think they did this year, and should epidemic fever be prevalent in this quarter of the globe, as it has been for the last 18 months, as at St. Thomas, Turk's Islands, the Bahamas, Havannah, and New Orleans, and even felt at Philadelphia, I do not think it surprising that it should first show itself, and then from the bad sanitary condition of the towns and garrisons become localised.

37. Unanswered.

38. I am not aware that I can submit any further information, or offer any other suggestion, than to remark, that during the summer the convict hulk "Coromandel" was broken up at Ireland Island. She is believed to have been about 80 years old, and to have been nearly 30 years here occupied as a hulk.

She was very rotten, and in the bottom were from 12 to 18 inches of decomposing black sludgy matter. The timbers from the lower part of the ship when laid in the Naval Yard, and this sludgy matter when wheeled across it in barrows, gave out most offensive odours, and for three or four weeks I daily suffered from headache while exposed to its influence. See part of answer to 33.

(signed) *John D. Anderson.*

31 December 1853.

ADDITIONAL QUESTION.

In your opinion, are the Casemate Barracks at Ireland Island, as at present occupied and ventilated, fitted for troops in this climate?—These barracks are so situated with reference to the ramparts, that they are shut out from the prevailing winds, and require even more than ordinary means of ventilation; as occupied and ventilated when I last was in them, I consider them totally unfitted for the occupation of any class of persons in this climate. With 14 instead of 25 men in each room, the internal staircase removed, and the well-holes closed, and with openings in or near the floor for the admissions by means of air-drains of a due quantity of fresh air, and near the ceilings for the exit of foul air, I consider they would then be fit for occupation; the noxious influence arising from the present privy being at the same time removed.

I also consider that a great improvement would be the addition of fireplaces as in the officers' quarters, of otherwise exactly similar construction in the same barracks.

You have stated that it was necessary to remove the "Medway" hulk to Grassy Bay from the basin; can you inform the committee if there was any loss to the public from this cause?—I can state the loss caused by the diminution of time during which the convicts were on the works, and by unproductive labour, arising from the ship being so removed. It amounted, from these causes, to 64 *l.* per week at all times, and from circumstances occasionally to a larger sum. The hulk has now been 13 weeks in the bay.

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TABLE 1.

COMPARATIVE STATEMENT, showing the Average Fall of Rain in the *Bermudas* from 1836 to 1839, both inclusive, as recorded by Captain *Page*, Royal Engineers; and for 1852 and 1853, as recorded by Mr. *Anderson*, Civil Engineer at Her Majesty's Dockyard.

MONTH.	1836 to 1839, BOTH INCLUSIVE.	1852.	1853.	REMARKS.
	Inches.	*Inches.*	*Inches.*	
January -	5·63	7·23	3·95	Generally stormy and unsettled.
February -	5·06	3·31	2·61	Generally changeable; stormy.
March -	3·76	3·92	5·30	- - Generally gales in early part; fine towards end. Hail in 1838.
April - -	3·10	3·62	5·48	- - Generally moderate, fine, and temperate.
May - -	3·30	3·17	2·80	Generally beautiful and serene weather.
June - -	5·34	4·01	1·11	Generally fine, with showers.
July - -	4·65	2·67	6·98	- - Generally dry. The fall of nearly 7 inches in 1853 unusual.
August -	3·37	7·00	3·51	- - Generally dry and sultry. 1834, 1835, and 1836, frequent and much rain.
September -	3·93	5·27	6·38	- - 1837, very dry; 1839, a hurricane. Generally unsettled, particularly towards end.
October -	10·90	4·26	6·69	- - Generally wet and unsettled, 1836; 17 ½ inches of rain. On 9th, 1837, 4 ½ inches.
November -	4·19	2·40	11·63	- - Generally fine. On 13th, 1853, 4·68 inches of rain.
December -	5·28	2·98	11·34	- - Generally gales and unsettled, with rain. On 14th, 1853, 4·38 inches of rain.

November and December of 1853 unusually stormy, there being a constant succession of very heavy gales, with, as the Table shows, an usual amount of rain.

31 December 1853. (signed) *John D. Anderson.*

TABLE 2.

COMPARATIVE STATEMENT, showing the Average Temperature at Noon at the Centre Signal Station, *Bermuda*, 134 Feet over the Level of the Sea, for the Months of May to October inclusive, for the Years 1852 and 1853.

MONTHS.	1852.	1853.	REMARKS.
	Fahrenheit.	*Fahrenheit.*	
May - - - - - -	75°	72° 4	The hot weather appears to have continued to a later period of 1853 than of 1852.
June - - - - - -	78° 8	78° 6	
July - - - - - -	82° 4	82° 5	
August - - - - - -	82° 8	82° 1	
September - - - -	79° 7	80° 8	
October - - - - -	74°	76° 1	

31 December 1853. (signed) *John D. Anderson.*

TABLE 3.

Appendix.

Answers of John D. Anderson, Esq.

TABLE 3.

COMPARATIVE STATEMENT, showing the prevailing Direction of the Winds for the Months of May to October inclusive, as observed at the Centre Signal Station, *Bermuda*, during the Years 1852 and 1853.

Wind's direction -	Between S. & W.		Between W. & N.		Between N. & E.		Between E. & S.	
Year - - -	1852.	1853.	1852.	1853.	1852.	1853.	1852.	1853.
Month - -	May.							
Number of days -	13	9	8	9	6	8	4	5
Month - -	June.							
Number of days -	17	8	6	10	4	10	3	2
Month - -	July.							
Number of days -	22	25	4	2	3	–	2	4
Month - -	August.							
Number of days -	19	26	6	3	5	1	1	1
Month - -	September.							
Number of days -	9	11	7	6	10	9	4	4
Month - -	October.							
Number of days -	7	16	11	5	9	6	4	4

Remarks.—In May and June of 1853 there were 37 days of northerly and 24 of southerly winds, while in the same months of 1852 there were 24 days of the first and 37 of the last. In July, August, September, and October 1853 there were 32 days of northerly and 91 of southerly winds, while in the same months of 1852 these numbers were 55 and 68 respectively. It would thus appear that, as compared with 1852, in 1853 northerly winds predominated to an unusual extent in May and June, and southerly winds in July, August, September, and October. In this abstract due easterly winds are included as south, due west as north. In May and June of 1852 there were seven days of west and three of east winds, and in the same months of 1853 one day of west and two of east winds. In July, August, September, and October of 1852 there were ten days of west and six of east wind; and in the same months of 1853 there were two days of west and four of east wind.

(signed) *John D. Anderson.*

31 December 1853.

Appendix.

Answers of John D. Anderson, Esq.

TABLE 4.

COMPARATIVE STATEMENT, showing the Days of Calms or of very Light Airs, as designated 0 and 1 in the usual Meteorological Registers running from 0 to 12, as recorded at the Centre Signal Station, *Bermuda*, for the Months of May to October, inclusive, for the Years 1852 and 1853.

MONTH.	Days of Calms or very Light Airs.		REMARKS.
	1852.	1853.	
May - - -	10	12	It would appear that, as compared with 1852, there had been unusually little movement of the atmosphere during July 1853.
June - - -	7	10	
July - - -	2	14	
August - - -	8	8	
September - -	7	7	
October - - -	7	8	
TOTALS - -	41	59	

31 December 1853. (signed) *John D. Anderson.*

TABLE 5.

COMPARATIVE STATEMENT, showing the Civil Population of *Ireland Island* belonging to the Naval Establishments, the Number of Dwellings, Average Cubic Space allowed in the Dwellings to each Person, the Number attacked by Fever, and the Number of Deaths from that cause, during the Epidemics in the Years 1843 and 1853.

The Return includes men, women, and children. It may be observed that this island belongs to the Crown, and is occupied by its establishments only.

POPULATION.		Number of Dwellings.		Average Cubic Space allowed to each Person in the Dwellings.		Number of Persons attacked by Fever.		Deaths from Fever.	
1843.	1853.	1843.	1853.	1843.	1853.	1843.	1853.	1843.	1853.
444	419	62	92	1,870	2,921	162	29	11	—

It appears that in 1843 there averaged 7·1 persons to each dwelling, while in 1853 that average was reduced to 4·55; that in 1843 each person (officers and men included) of a family was allowed, for all purposes, 1,870 cubic feet of house-room, which in 1853 had been increased to 2,921 cubic feet; that in 1843, 36·54 per cent. of the population were attacked, while in 1853 it was only seven per cent.; that in 1843, 2·5 per cent. of the population died, while in 1853 no deaths whatever occurred.

31 December 1853. (signed) *John D. Anderson.*

TABLE 6.

COMPARATIVE STATEMENT, showing the Amount of Sickness among Negro or Mulatto Artificers and Labourers employed in the Department of the Director of Works in Her Majesty's Naval Establishments at *Ireland Island*, *Bermuda*, during the Months of April, May, June, July, and August of 1852 and 1853.

MONTH.	1852.			1853.			Per-centage of Sickness to Strength.	
	Number Borne.	Number of Days as for One Man.		Number Borne.	Number of Days as for One Man.			
		Borne.	Sickness.		Borne.	Sickness.	1852.	1853.
April - -	19	570	8 ½	24	720	17 ½	1·5	2·43
May - - -	20	620	2	27	837	10 ½	0·32	1·25
June - - -	19	570	1 ½	29	870	12 ½	0·26	1·43
July - - -	20	620	6	32	992	37	0·97	3·73
August - -	20	620	39	32	992	59 ½	6·3	6·0

Remarks.—The health of the Europeans employed on the works did not vary from the usual average during the above months of 1833. The unusual amount of sickness among the negroes and mulattoes called attention.

31 December 1853. (signed) *John D. Anderson.*

Appendix.

Answers of John D. Anderson, Esq.

TABLE 7.

COMPARATIVE STATEMENT, showing the Amount of Sickness among the Convicts employed on Works at Her Majesty's Naval Establishments at *Ireland Island*, *Bermuda*, during the Months of April, May, June, July, and August of 1852 and 1853.

MONTH.	1852.		1853.		Per-centage of Sickness to Strength.	
	Number borne on last Day of each Month.	Number Sick on last Day of each Month.	Number borne on last Day of each Month.	Number Sick on last Day of each Month.	1852.	1853.
April - -	1,031	161	784	137	15·6	17·5
May - -	1,030	161	776	182	15·6	23·4
June - -	1,026	202	698	227	19·7	32·5
July - -	1,024	202	693	234	19·7	33·7
August -	1,019	192	686	233	18·8	34·0

No. 20.

ANSWERS of Colonel *Oakeley*.

Answers of Colonel Oakeley.

1. I ENTERED the army in the year 1836, having been appointed to the 56th Regiment of infantry, and I have served in that corps ever since. I have served with my regiment in Jamaica, Canada, Gibraltar, and Bermuda.

2. I have no former experience of what may be truly termed an epidemic visitation, but during my service in Jamaica I witnessed a great deal of yellow fever.

3. The first case I heard of, was that of the wife of private James Davis of the 56th Regiment. I did not, however, see her. She was taken ill on the 13th, and died on the 20th August 1853.

4. The case before mentioned originated at Paget Island. The house in which the woman lived is situated near to a stagnant pool. She had resided in this house since about the middle of November 1852, and seldom or ever left the house, except for the purpose of taking home clothes which she had washed. Her illness terminated fatally, but without black vomit.

5. Unanswered.

6. I have always been and still am of the opinion, that the late epidemic fever originated in this country. There was an unusual quantity of rain, which often fell early in the morning and was succeeded by great heat, and but little breeze. I am firmly of opinion that the noxious gases arising from the above causes, combined with electrical influence, originated the late epidemic fever.

7 to 11. Unanswered.

12. The dietary of the troops consists of a breakfast of tea and bread, a dinner of fresh meat on five days of the week, and of salt meat the remaining two days, and of an evening meal of tea and bread. Their mode of life is similar here to what it is elsewhere. The cubic space allotted to each man I am ignorant of, but it is far too small for a healthy condition. Soldiers on being attacked by sickness are at once sent to hospital.

13. There can be but little doubt that the exposure to the night air, to which a soldier is liable, must render him more susceptible of fever, or rather disease, than a person not so exposed.

14. Unanswered.

15. The occupation of either Fort George or Fort Victoria by troops is in my opinion wrong. They are damp and consequently they are unwholesome; added to this the privies emit a stench perfectly sickening, and the whole atmosphere is tainted by it. They are likewise overcrowded and overcrowding, combined with horrible smells, must affect troops or anything else unfavourably.

16. I have been stationed in St. George's from the 17th July 1851, to the 30th September 1853, since which I have been in quarters in Hamilton. I have been in command of the 56th Regiment since 16th May 1853.

17. The town of St. George is situated in a hollow open to the south. The Royal Barracks would be well situated were it not that they overlook the town, from

Appendix.

Answers of Colonel Oakeley.

from which bad air must arise. Fort George is situated to the westward, and Fort Victoria, to the north of the town. The means of draining the town are numerous, barring the want of public spirit, and the absence of public spirit likewise prevents any precautions being taken to keep the small houses, lanes, or back-yards, as clean as they might be. The situation of the burial-ground is very central and very bad, and is surrounded by very dirty habitations. The slaughter-houses are situated opposite to Ordnance Island, and I should say the late Ordnance storekeeper must have found them a great nuisance.

If, as is, I fancy, well known, certainly believed, bad drainage, bad ventilation, and dirt, are likely to be productive of disease, then I am not aware of any place so adapted to engender, certainly to aggravate it, as the situation and condition of St. George's.

18. I cannot say what police regulations may exist respecting the night-soil in either town, but it strikes me it is left a good deal to its own resources, with apparently a roving commission to go where it pleases, for I generally meet it in most back lanes to a considerable extent.

19. Unanswered.

20. I give the distribution of the force in the command on the 1st August last including all ranks. It is, however, not a complete answer to the question, for I cannot get a return showing the number at each place in the command at that date. There were at St. George's, (exclusive of Forts George and Cunningham, Hen Island, and military prison) on the above date, as follows; viz.

Royal Artillery	104	
Royal Engineers	50	
56th Regiment	486	
		640
At Hamilton:		
56th Regiment		93
At Fort Cunningham:		
Royal Artillery	3	
56th Regiment	26	
		29
At Ireland Island:		
Royal Artillery	48	
Royal Engineers	48	
56th Regiment	315	
		411
At Ferry Point: 56th Regiment		4
At Prospect Hill: Royal Engineers		1
At Hen Island: Royal Artillery		1
At Boaz Island: 56th Regiment		41
At Fort George:		
Royal Artillery	3	
56th Regiment	53	
		56
In Military Prison:		
Royal Artillery	1	
56th Regiment	14	
		15
TOTAL		1,291

Including Officers, Serjeants, Drummers, and Rank and File.

21. The married families of the 56th Regiment who lodged in the town of St. George's, were placed under canvas in the Hospital Field. Several died; but I think they had contracted the disease previous to their removal, which took place on the 3d September. On, as well as I remember, this day I waited on Colonel Philpotts, the then acting governor, to ascertain to what extent camp-equipage could be furnished, and was given to understand there was sufficient for 1,200 men. I was on the evening of the 12th September directed to move the men of the regiment stationed in the Royal Barracks to Ferry Point the next morning. I indented for tentage for 400 men, allowing five men to a tent, and I think 30 tents were all I could get. I however moved, and I am sure the change

Answers of Colonel Oakeley.

change was very beneficial, for although many men returned to hospital, I feel certain they had contracted the disease before they moved.

22. The cubic space allotted to each convict, is more in the Boaz Island prison than the soldier has in Ireland Island barracks. The proportions being as 317 to 250 cubic feet.

23 to 27. Unanswered.

28. More rain fell, and the temperature was somewhat higher, with less breeze than in any previous year that I have been quartered here.

29 and 30. Unanswered.

31. I can give two extraordinary instances which occurred in the regiment whilst serving in Jamaica, in both of which the disease was not contagious. The first instance is mentioned in the Appendix to the Second Report on Quarantine, p. 342. Yellow fever of a very malignant form broke out amongst the men of a detachment of the regiment, consisting of 90 men and four officers at Chappleton. Every individual except one was attacked. To stay the disease the detachment was moved to Port Royal, and it ceased immediately. The company that relieved the Chappleton detachment was attacked; but the men from Chappleton brought no disease to the men at Port Royal. Again, a company of the regiment was stationed at Apostle's Battery, in sight of and about two miles distant from Fort Augusta, the then regimental head-quarters. There is no hospital at Apostle's Battery, and on a flag being hoisted there as a signal that a man was attacked by the fever, a boat was immediately sent from Fort Augusta, and the patient brought into the head-quarter hospital. All the men at Apostle's Battery were attacked, and brought into hospital, but no one at Fort Augusta had the fever.

32 and 33. Unanswered.

34. Under any circumstances, I should recommend the troops being encamped during the months of June, July, August, and September, during which time the vacated quarters could undergo a thorough cleansing and fumigating. Even in an encampment, I would never have more than 120 men, and I should frequently change their position.

35. The result invariably beneficial. Ireland Island is a case in point. Up to the 19th October the troops at that station had enjoyed comparative immunity from fever. On that day a telegraphic message informed me that fever cases were beginning to show themselves, and I directed each case as it occurred to be notified to me. On the 20th, 21st, 22d, and 23d the fever continued to increase. On the 24th I moved 100 men to Tucker's Island. The same evening a telegraphic message informed me cases still went into hospital. On the 25th I moved 50 more men, and I think I may say the fever was stopped. No man was attacked at Tucker's Island. One or two convalescents sent there from the Naval Hospital and Port's Island had relapses, but they did not infect any of the men from Ireland Island.

36. The best reply I can make to this question is to copy a portion of a paragraph from the "Second Report on Quarantine," p. 62: "While cities and countries in a bad sanitary state are sometimes devastated by pestilence, at other times their sanitary state remaining unchanged, these same cities and countries remain free from pestilence for indefinite periods, the intervals occasionally numbering many years, and then sometimes suddenly, but more frequently by slow and appreciable degrees, pestilence again returns, and rages with its former fury."

Why this is. Why conditions which sometimes act so powerfully, do not universally and invariably produce epidemic disease, is a problem yet to be solved. What is certain, however, and what is of the utmost practical importance, is that a bad sanitary condition is at all times attended with an excess of sickness and mortality, and that whenever epidemic diseases do prevail, they concentrate their violence in these unhealthy localities. Still the sanitary conditions as far as is apparent, remaining the same, epidemics return only periodically. It has been generally inferred, therefore, that for the development of that extraordinary amount of the same kind of disease simultaneously amongst great numbers of the population which constitutes an epidemic, there must be, besides the known conditions, the presence of some other condition as yet unknown; and hence these known conditions are commonly said to be not generating, but localizing causes; the unknown or real causes being, in our ignorance of their true nature, compared to poison clouds, which pass from city to city and

Answers of Colonel Oakley.

country to country, leaving and scattering poison germs, the seeds of pestilence, for the development of which the localizing conditions which have been described, afford the fitting and perhaps necessary nidus.

37 and 38. Unanswered.

(signed) *S. Oakeley*,
Lieut.-Colonel Commanding 56th Regiment.

Bermuda, 23 February 1854.

No. 21.

Answers of Captain *R. W. Lacy*, 56th Regiment.

Answers of Capt. R. W. Lacy.

1. I have been 21 years in the infantry of the line, during which period I have served four years in Jamaica, two in Canada, five at Gibraltar, two in Bermuda, and the remainder at home.

2. to 11. Unanswered.

12. The dietary of the troops consists of a daily ration of a pound of bread and a pound of meat, five days in each week; the meat ration is fresh beef; the remaining two, of salt pork. The meat is usually boiled, so as to make soup; this, with vegetables provided out of the soldiers' pay, but from the occasional scarcity in the market are sometimes insufficient, constitutes the soldier's dinner meal, and is served at one o'clock in the day. His breakfast, at seven in summer, and eight in winter, consists of bread and tea; and the evening meal, likewise of bread and tea, is served at five o'clock throughout the year. At this station, Ireland Island, the only licensed liquor stores are two small buildings, situate a short distance outside the fortifications; one of these is used as a canteen for the Sappers and Miners, the other for the troops of the line, where they are permitted to purchase for themselves a sufficient quantity of liquor, but only at stated periods, viz. for one hour from 12 noon until 1 o'clock, and a second period of an hour during the afternoon. In the casemate barrack, occupied by the troops of the line, the cubic space allotted to each man is 380 feet in the upper rooms, and 288 in the lower or ground floor; the greater space in the upper rooms arises from their being vaulted ceilings, and more lofty. Immediately on a soldier being attacked with any disease, he is removed to the naval hospital, about a mile distant from the garrison.

13. The duties of a soldier expose him to risks not necessarily incurred by others; he must mount his guard, and go on sentry, whether the weather be fair or foul; doubtless the frequent exposure to damp and wet on these occasions has a predisposing effect, and the night duties bringing him under the influence of any noxious or pestilential vapours with which the atmosphere may be charged, it ought not to create surprise should he be attacked with fever.

14. Unanswered.

15. The casemate barracks at Ireland Island, occupied by the troops of the line, consists in a long block of buildings, running from north-east to south-west, screened on the north-west and south-west by the fortifications, the walls of which on the south-west approach within nine feet, and rise to equal height with the building; a very imperfect ventilation is the consequence.

In a climate so remarkable as Bermuda for extreme humidity, a free circulation of the air, quite unattainable in the locality of this barracks, is absolutely necessary to a healthy state of the atmosphere; the ventilation of the building might, however, be improved by constructing chimneys, a measure already under consideration by the Engineer department. On the north-west, and adjacent to the barracks, is a privy for the accommodation of the non-commissioned officers and men, the ineffective drainage of which, arising from its faulty construction, and its being beyond the influence of the tides, cause the soil, after descending a large shaft, to accumulate at the foot of the walls of the fortifications, emitting gaseous exhalations of a most pernicious and offensive nature, which taint the atmosphere of the barrack. To the north-east is a building of a similar description for the officers, almost equally objectionable. A temporary building, standing

Appendix.

Answers of Capt. R. W. Lacy.

standing out from the walls, the communication with which is by means of a stage, is in course of construction for the non-commissioned officers and men; and its site having been chosen with a view to the soil being carried off by the flow of the tide, no doubt this object will be attained.

The naval hospital, where the sick of the garrison of Ireland Island are sent for treatment, stands on a small eminence, overlooking to the east a salt-water lake, and bounded on the north and south by the sea. To the westward, on another little elevation, stand the quarters of the deputy inspector, and other medical officers of the establishment. It is calculated to accommodate 80 patients, possesses every requisite convenience, and is highly eligible in every point of view.

16. I have been stationed at Ireland Island since the 1st September 1853, and have been in command of the garrison there since the 21st of the same month.

17. The soil is of a sandy nature. There is no town on Ireland Island. The few scattered buildings beyond the walls of the fortification are Government property, and occupied by persons in Government employ. The burial-ground skirts to the eastward the margin of the lake in the vicinity of the hospital, and is about three-quarters of a mile distant from the garrison. During the prevalence of the fever, a fetid odour, more remarkable in a humid state of the atmosphere, appeared to proceed from the lake before mentioned. In digging the graves, it was found necessary in some parts of the graveyard to perform the work at low tide, to avoid the inconvenience consequent on the flow of water, at a depth of two or three feet. Possibly the water filtering from the graves into the lake may have occasioned this noxious odour. At the time of the breaking out of the fever, a guard of a corporal and six privates were stationed in a guard-house at the western extremity of the island, furnishing two sentries, one within the hospital gates, the other on the banks of the lake, at the foot of the hill on which the hospital stands. It is worthy remark, that of 50 fever cases, originating amongst the troops of the line at Ireland Island, 16 were attacked whilst on, or soon after being relieved off. this guard, and of these, 12 died; the total number of deaths being 24. The total number of all ranks daily mounting guard at this station was, up to the 15th September, 51. This number was reduced by the sentries being discontinued from time to time, as the progress of the disease and the removal of portions of the troops rendered it necessary, until at length, with the concurrence of Deputy Inspector Hilditch, at first one, and shortly after the remaining sentry was withdrawn from the hospital.

18. & 19. Unanswered.

20. The number and description of force stationed at Ireland Island on the 7th September, the date on which the disease broke out, was as follows:

	Officers.	Non-Commissioned Officers and Men.
Royal Artillery, occupying the barracks in the Keep - -	1	47
Royal Engineers - - ditto - - ditto - - -	2	—
Royal Sappers and Miners, occupying a wooden building outside the walls of the fortifications - - - -	- - -	46
56th Foot, occupying the casemate barracks - - -	8	295
TOTAL - - -	11	388

21. Mr. Ballingall, the naval storekeeper, having given up a portion of a large new building in the dockyard for the temporary accommodation of the troops, it was prepared for their reception, under direction of Mr. Anderson, the naval engineer; and on the 27th September, 80 non-commissioned officers and men were moved into it from the casemate barracks. A careful observation of the men, removing them to hospital on the first symptom of an attack, an unremitting attention to ventilation as far as practicable, together with whitewashing the rooms, and a constant cleaning of the drains, were additional precautions taken

Appendix.

Answers of Capt. R. W. Lacy.

taken to arrest the disease; but the number of cases augmenting, notwithstanding these measures, a further separation of the garrison was determined on by Major Oakeley, at the time Acting Governor. Accordingly, on the 24th October, one officer and 100 non-commissioned officers and men were removed to Tucker's Island; and on the 28th of the same month another officer and 50 more followed, a portion being accommodated in a house, and the remainder in tents. On the 11th November, two officers' rooms in the Commissioners' house at the Keep were temporarily appropriated as extra accommodation for the non-commissioned officers and men of the Royal Artillery, their barrack being considered too crowded.

22. to 25. Unanswered.

26. The east wind, with its usual attendant, extreme humidity and a high temperature, appeared most to favour the spread of the fever.

27. No.

28. I have understood the average temperature to have been higher and more rain to have fallen during the hot season of 1853 than is usual.

29. I observed that those attacked were generally persons of a plethoric habit of body.

30. Compared with Europeans, I understand the inhabitants of the colony to have suffered but little from the late epidemic. The disease seems to have attacked equally males and females, adults and children; but amongst the coloured population there appears to have been but few cases.

31. I am of opinion yellow fever can be communicated either by direct contact with the person suffering from it, or with the dead body of one who had died of it. I am not aware of any positive evidence of its having been communicated by means of articles, or dress, or bedding; but conceiving it a necessary precaution, avoided the danger of such communication as far as practicable.

32. Unanswered.

33. I am not aware of any means of prevention having been discovered; but I would suggest that steps be taken with a view to a perfect drainage of the towns, that the streets be kept in a wholesome state of cleanliness, and that the dwellings of the lower orders should be put under such surveillance as would prevent crowding, or accumulation of any kind calculated to produce malaria.

34. Immedate removal from the locality.

35. Of the two officers and 150 non-commissioned officers and men removed from Ireland to Tucker's Island, in the latter end of October, not one was attacked with fever; but the daily proportion of cases in regard to the members of the remaining force, showed no diminution for nearly a month after, and the disease appeared to gain in intensity, and become more virulent.

I find, on further inquiry, that three slight cases of fever occurred at Tucker's Island about three weeks after the arrival at that station, but they all recovered after a short illness.

36. Unanswered.

37. No.

38. On the evacuation of the general hospital at St. George's on the 30th September, 24 of the most severe cases of fever were sent from that establishment to Ireland Island; a party of the five assisting to land and convey the patients to the naval hospital, several of the men employed on this duty were attacked with the disease and died, and from this moment it appeared to gain ground in the casemate barrack occupied by the 56th. During the period of the epidemic, of the Royal Artillery occupying the Keep, two officers and five non-commissioned officers and men were attacked; of whom, one officer and one non-commissioned officer died; but of the whole number, only one non-commissioned officer and two men may be said to have taken the fever at Ireland Island; and the non-commissioned officer who died of it, was attacked some time after his admission to hospital with a sprain. The two officers, and other non-commissioned officer and man, had been at St. George's, where it may reasonably be supposed they contracted the disease. Of the Royal Sappers and Miners occupying the wooden building outside the fortifications, five non-commissioned officers and men were attacked, all of whom recovered. I view the comparative exemption from the disease of these two corps as a striking evidence of the advantages they enjoyed in the superior ventilation of their barracks. If it be considered that the large number of convicts employed on the public works at Ireland Island renders imperative

Answers of Capt. R. W. Lacy.

imperative the presence of so considerable a portion of the military force in the country as at present occupies the post, I would suggest the building of temporary barracks outside the fortifications, as a means of avoiding crowding the casemate, and the danger of disease arising therefrom. I would recommend some improvement in the construction of the officers' and men's privies, as a means of preventing further evil consequences, which may reasonably be supposed to arise from the accumulation of night-soil.

The erection of buildings for the accommodation of the families of the married soldiers is absolutely necessary; the sheds which they formerly occupied being now, from their dilapidated condition, quite uninhabitable. They have been temporarily lodged in one of the unfinished workshops of the dockyard, but when it shall become necessary for them to vacate this building, they will absolutely be without a roof to shelter them.

I would further suggest that a canteen be built within the fortifications, for supplying the troops with liquors, &c., under the established regulations; the present system, which affords them only two opportunities for periods of an hour each during the whole course of the day, for procuring drink of any kind, and away from their barracks, is most inconvenient and objectionable.

Finally, the wooden building occupied as a barrack by the Royal Sappers and Miners is quite unfit to be inhabited during the rainy season; the roof admits the water to such an extent as to oblige the troops to remove their bedding, and their exemption from sickness during the period of the epidemic can only be attributed to the salubrity of the locality, arising from a free ventilation.

(signed) *R. W. Lacy*,
Captain 56th Regiment.

No. 22.

ANSWERS of Captain *H. A. White*, Royal Engineers.

Answers of Capt. H. A. White.

1. SIXTEEN years in the corps of Royal Engineers, in Canada and Bermuda.
2. Very slight; during the prevalence of cholera in England in 1849.
3. About the 3d September last.
4. At St. George's. Ended fatally.
5 to 15. (Medical).
16. Never stationed at St. George's. At Ireland Island two years, since December 1851; in command of the 21st company Royal Sappers and Miners the whole of 1853.
17. The soil to be found in these islands appears to be decayed vegetable matter collected in the valleys, of a very prolific nature. The town of St. George's is a dirty, ill-ventilated, ill-constructed place, lying in a hollow beneath the barracks and forts. The means of drainage do not exist, by reason of the greater portion being nearly on a level with the sea. I consider it would be a difficult task to effect this properly, and from the observations I have made at various times, I consider the town particularly suited to aggravate a tropical epidemic. The above remarks do not apply to Ireland Island generally, but the dockyard presents in one or two instances favourable objects for attracting a disease of this nature, from the offensiveness of a privy used by the workmen, and the quantity of decayed wood lying about, the proceeds of the hulk "Coromandel."
18. (Local.)
19. (Historic.)
20. (Barrack Master.)
21. (Naval.)
22 to 24. (Convict.)
25 and 26. (Medical.)
27 and 28. (Historic.)
29 to 37. (Medical.)
38. (None.)

(signed) *H. A. White*,
9 January 1854. Captain Royal Engineers, Commanding.

Appendix.

No. 23.

ANSWERS of Captain *Jervis*, R.N., Deputy Superintendent of Convicts.

Answers of Capt. Jervis, R.N.

1. THIRTY-SIX years in Her Majesty's naval service.

2. Little or none.

3. The first case which came under my observation was the prisoner, Robert Hall, who died on board the "Thames" hulk, on the 16th August 1853, and from the appearance of the body after death, I considered it was a case of yellow fever, although denied as such by the medical officers.

4 to 7. Unanswered.

8. Yes. Three instances in my own family, where three of my servants were attacked (one of whom died) when in attendance on my eldest daughter; and further, I consider that it was communicated to my two children from the "Tenedos" hospital, when she was swung broadside to the southerly wind, and carried to my house, as my children were attacked in the only two rooms facing the vessel, where they slept.

9 to 14. Unanswered.

15. The "Tenedos" hospital I consider as too near the prison establishment at Boaz Island, for my reasons as stated in No. 8; and further, I consider it was endangering the lives of those living on Boaz Island that fever convalescents should be sent to occupy Prison B.; and on the prisoners in a body requesting me to apply to the Governor on the subject (as there was a great panic amongst them), I did so, to his Honour Major Byles, and suggested that Tucker's Island should be used for that purpose, as Mr. Tucker had offered it to the Government; but on this being referred to the medical superintendent, he objected to it, considering the prison B. best.

16. I have been stationed at Ireland and Boaz Island as deputy-superintendent of convicts, from February 1850.

17. The burial-ground of the convicts communicates by a bridge to Boaz Island, and on the epidemic assuming a more malignant form on board the "Tenedos," as well as effluvia from the burying-ground, I suggested the propriety of putting quick-lime into the coffins, and raising the ground three feet with mould and quick-lime over the graves, which was done, and which was reported to the Secretary of State; but I consider Watford's Island a bad place for the burial-place from the porous nature of the soil, which since the above precautions being taken, has not kept in the effluvia from the graves, which will also be detrimental to the body of prisoners on this island, if a break-out of fever occurs this summer.

18. The night-soil here is carried by drains daily sluiced to the sea (Boaz Island).

19. We are now told that fever cases were prevalent here in July last, but no one connected with this establishment on shore were aware of any cases until after the removal of 15 convalescents from the "Thames," which caused the greatest possible excitement and panic amongst the prisoners here, especially after the guard (Hans) was attacked the next day in a most malignant form, he having brought them up.

20. Unanswered.

21. On the 29th August, when a fever (reported to the Acting Governor, Colonel Phillpotts, as not being yellow fever) had very much increased on board the "Thames," I suggested the propriety of his applying to Mr. Ballingall for the "Weymouth" being sent down to place the healthy prisoners on board her, which application was made; but in consequence of the "Weymouth" not being fitted with a rudder, the "Cassius" was sent on the 30th, when those removed to her (anchored in the harbour) were not attacked; so soon as the "Weymouth" was ready she was removed to St. George's, where she arrived on the 5th September, and all the sick removed from the "Thames" to her, except a few incapable of being removed. But the impression on my mind was that the cases were yellow fever, and in this opinion others coincided.

22. The dietary of the convicts in summer, fresh meat four times per week, salt meat the other three days, with bread, vegetables, rice, cocoa, tea, sugar, and half a gill of rum a man. They lead a regular life, and work eight hours *per diem* all the year round, and are withdrawn when it rains. With respect to

Answers of Capt. Jervis, R.N.

Boaz Island, the cubic space allotted to each man is 317½ cubic feet. Sick are sent to the "Tenedos" hospital, and there separated from the healthy. They occupy hulks at St. George's and Ireland Island, and the prisons here. Their winter diet is fresh meat three times per week, and salt pork the other four days.

23. The dietary the same on board the other hulks, and in all respects the same as Boaz Island.

The number of cubic feet on board the "Medway" and "Thames" is * in the former, and * feet in the latter.

* So in copy.

Cannot be correctly ascertained.

24. Nine years. I consider her position a very bad one for free ventilation, being always aground and lying under a high cliff.

25. Unanswered.

26. It appeared to increase more when we had the wind from the eastward and southward.

27. Unanswered.

28. The temperature was higher in 1853 than usual, more especially about the time the comet was seen, and I experienced a very sickening smell from the sea water, which I do not remember from my arrival in 1850, which frequently gave me an inclination to vomit. There was also a greater quantity of rain than usual.

29 & 30. Unanswered.

31. Answered in No. 8, according to my opinion.

32. Unanswered.

33. Dispersion and separation.

34. The same as No. 33.

35. Yes; separation did arrest it.

36 to 38. Unanswered.

(signed) *W. W. Jervis*, Captain, R.N.,
Deputy Superintendent of Convicts.

No. 24.

Answers of *W. Tucker*, Esq., Barrack Master.

Answers of W. Tucker, Esq.

1. I have been 34 years in Her Majesty's service as barrack-master at Bermuda, and not off the island for the last 31 years.

2. I was in Bermuda during the prevailing yellow fever in 1819, which was very fatal, more particularly to Europeans and other transient persons. I do not recollect how the troops were then affected.

I was also present during the fever of 1843, which was very fatal to the troops, but not so much so to other persons as that in 1819.

I was also present during the late yellow fever in 1853. That was of a much more malignant kind than either of the preceding, and the mortality much greater.

3 to 5. Unanswered.

6. My opinion is, that in every instance of yellow fever in Bermuda it was imported from the West Indies.

7. Unanswered.

8. I do think it is communicable. I was first led to form that opinion by seeing a man who died of yellow fever (the first case, I think, in 1843) in a house in which I was informed a sailor boy had died not long before of fever, he having been brought on shore from a vessel from the West Indies while ill, and taken to that house. Perhaps the man I saw might have slept in the bed that the boy had died on.

9 to 15. Unanswered.

16. I have been stationed at St. George's the whole period of my service, and frequently visited the out-stations during that time on duty as barrack-master.

17. The soil is of a light and sandy nature, retaining moisture but a very short time. The town of St. George's is situated somewhat in a valley; the Royal Barracks on a hill to the north-east of it, a very short distance off, and Fort George on a higher hill to the westward. There are no drains in the town, nor any stagnant water in its vicinity. I consider there is not sufficient precaution

Answers of W. Tucker, Esq.

precaution taken to keep the small houses, lanes, and back-yards clean. There is no place of public deposit for the sweepings of yards and other rubbish; such a place is much needed. The established burying-ground for the inhabitants is the churchyard, about the centre of the town. There is one slaughter-house belonging to the contractor for the supply of fresh meat to the troops; it is situated on one of the wharves in the town; it is kept very clean, and not offensive. I think it likely there are about five oxen a week slaughtered there. Not many pigs, I think, are kept in the town.

18 The night-soil is deposited in privies, which are occasionally emptied, but perhaps not as often as they should be, and in some places are offensive, in summer particularly.

19. Until about the year 1812, when the population became considerably increased by strangers from the West Indies and other places, no part of the world was more healthy, I believe, than Bermuda generally.

20. The number of soldiers in barracks at the time were—

In the Royal Barracks	330	
,, Fort Victoria	110	
,, Fort Albert	30	
,, Fort Catherine	20	
,, Fort George	60	
,, Fort Cunningham	30	
,, Regimental hospital	40	patients.
,, Ordnance hospital	16	
,, Sappers' barracks	40	

The military force at St. George's, when the disease broke out, were infantry occupying barracks, except some married soldiers who lived with their wives in private lodgings in the town.

21 to 23. Unanswered.

24. The convict hulk "Thames" was placed close to the shore, resting on the bottom, and communicating by a short stage with the shore. I do not think her position was a good one in a sanitary point of view, the high ground near her preventing a free circulation of air.

25. None whatever.

26 to 29. Unanswered.

30. The inhabitants seem more exempt from yellow fever than Europeans, or other persons from cold climates. The coloured persons seem to have it more mildly than the whites.

31. I doubt the mere touch of the person communicating the disease, but I think the effluvia from a dead body, or foul clothing or bedding, likely to impart it.

32. I do not think it likely to be so produced.

33 and 34. Unanswered.

35. The separation of the force seems to have arrested in a great measure the spread of the disease.

36. Because the climate is generally so healthy.

37. I do not know.

38. I can give no further information, or offer any suggestions on the subject.

(signed) *Wm. Tucker*, Barrack-master.

No. 25.

ANSWERS of Mr. *J. B. Howes*, Acting Overseer, "Thames" Hulk.

Answers of Mr. J. B. Howes.

1. TWENTY years in the Convict department; Bermuda.

2. Had the fever at the Royal Naval Hospital in 1837. Served in the "Antelope" hulk, at St. George's, all through the fever of 1843, and was ordered to join the "Thames" on the 29th August 1853. There were 60 cases of fever on board.

3. When I took command of the "Thames," at the above date, the epidemic being at its height.

4. As the ship was full of disease, and consequently of infection, and some of the cases had terminated fatally before that time, I have no doubt that the above cases

Appendix.

Answers of Mr. J. B. Howes.

cases originated on board. Several of the number died, and many of them with black vomit.

5. My duties were confined to using my utmost endeavours to contribute to the comfort and alleviate the sufferings of the sick and convalescent.

6. I am of opinion that the disease was imported, but I am not in a position to enable me to trace it minutely. There is every probability that the lady who died on board the "Merlin," and was buried in St. George's, died from yellow fever, as the steamer came from an infected port; and it is farther probable that she was known to have done so, from the fact that her infant was sent on shore in a grown-up person's garments, its own and mother's having been thrown overboard, according to the report of the person who brought it on shore. I would also draw the attention of the Commission to the facts that the ships "Dauntless," "Highflyer," and "Scorpion," whose crews had suffered terrifically from yellow fever in the West Indies, arrived, and two of them were admitted into the "Camber" in Her Majesty's dockyard some time before; that the men belonging to them landed and walked about the dockyard before their hair had re-grown after the fever, where prisoners were continually passing and employed; that the seamen and dockyard labourers, who were working with prisoners, had access to and used the same privy; that clothing belonging to officers who had died on board these ships of the yellow fever in the West Indies was sold by public auction at the dockyard, and some of those clothes were purchased and worn by guards serving in the hulk which I commanded, some of whom have since died of the epidemic. I am of opinion, from these and other circumstances, that the fever originated in Bermuda, at the dockyard, and that it was communicated to the "Thames" at St. George's, through the hospital ship "Tenedos," by the return of patients.

7. The same becoming only more decided the more my attention has been directed to the subject.

8. Undoubtedly communicable. Every instance of an attack is an instance of such communication. With scarcely an exception, every healthy man that volunteered from Boaz Island as a nurse for the "Thames" was struck, and several of them died.

9. I know no circumstances in which I do not think it may be communicated.

10. I beg to refer to my answer to No. 6.

11 to 15. Unanswered.

16. I refer to my previous answer to Nos. 2 and 3.

17 to 20. Unanswered.

21. So far as the convicts are concerned, the healthy were separated from the sick, and removed on board the "Cassius" on the 30th August. On the 4th September the sick and convalescents were all removed from the "Thames," and transferred to the "Weymouth," and the soiled bedding, blankets, clothing, &c. were all destroyed.

22. Abstract of the Victualling of one Convict every Day in the Week:

DAY.	BREAD.	BISCUIT.	COCOA.	SUGAR.	SALT PORK.	FRESH BEEF.	RICE.	VEGETABLES.	RUM.
	Lb.	*Lb.*	*Oz.*	*Oz.*	*Lb.*	*Lb.*	*Oz.*	*Oz.*	*Gill.*
Monday -	- -	1	¾	1 ½	½	- -	4	- -	½
Tuesday -	1 ¼	- -	¾	1 ½	- -	1	–	8	½
Wednesday -	1 ¼	- -	¾	1 ½	½	- -	4	- -	½
Thursday -	1 ¼	- -	¾	1 ½	½	- -	4	- -	½
Friday -	1 ¼	- -	¾	1 ½	- -	1	–	8	½
Saturday -	1 ¼	- -	¾	1 ½	- -	1	–	8	½
Sunday -	1 ¼	- -	¾	1 ½	- -	1	–	8	½

The sick only get ¾ lb. beef.

The dietary of the convicts is regulated according to the Government scale, which I annex. The space allowed to each man within the open cell, and exclusively of the central passage, which is also open, is as nearly as can be arrived at, under the variety of circumstances, from 190 to 200 cubical feet. When the men are taken sick they are separated from the healthy, and placed in a portion of the main deck, called a sick bay. Generally speaking, they are

Appendix.

Answers of Mr. J. B. Howes.

divided between the gun-deck and orlop deck of the hulk. During the day they have free access when on board to the spar-deck also.

23. The above particulars, in answer to No. 22, are all intended to apply specially to the "Thames."

24. A convict hulk has been lying in the late position of the "Thames" for upwards of 20 years. The "Antelope" was sent there in September 1833, and the "Thames" replaced her in 1844. I think the position chosen for these ships was not by any means a good one, though I should not be justified in saying that it was calculated, or ever did originate disease in either of them.

25 to 30. Unanswered.

31. I refer to my former answer, No. 8.

32. Unanswered.

33. Separating the sick from the healthy, and keeping them separate.

34. I refer to my last answer, No. 33. The earlier the stage at which measures are taken for this purpose, in all cases, I believe the better.

35. I observed that there was a diminution in the virulence and fatality of the disease as soon as such separation was effected at St. George's, last autumn.

36 to 38. Unanswered.

(signed) *J. B. Howes,*
Acting Overseer, "Thames" Hulk.

St. George's, Bermuda,
18 February 1854.

"THAMES" HULK.

STATEMENT of the Establishment and Convicts, showing the Number Borne, Sick, and Died, &c. &c., from the 1st July to the 31st December 1853.

DATE.	ESTABLISHMENT.								CONVICTS.		
	Number Borne.	Number Sick.	Doing Duty at			Died.			Number Borne.	Number Sick.	Number Died.
			Thames.	Cassius.	Weymouth.	Thames.	Cassius.	Weymouth.			
1853:											
1 July	21	–	–	–	–	–	–	–	216	16	–
2	21	–	–	–	–	–	–	–	216	13	–
3	21	–	–	–	–	–	–	–	216	13	–
4	21	–	–	–	–	–	–	–	216	16	–
5	21	–	–	–	–	–	–	–	216	26	–
6	21	–	–	–	–	–	–	–	216	22	–
7	21	–	–	–	–	–	–	–	216	22	–
8	21	–	–	–	–	–	–	–	217	19	–
9	21	–	–	–	–	–	–	–	217	18	–
10	21	–	–	–	–	–	–	–	217	18	–
11	21	–	–	–	–	–	–	–	217	20	–
12	21	–	–	–	–	–	–	–	217	18	–
13	21	–	–	–	–	–	–	–	217	21	–
14	21	–	–	–	–	–	–	–	217	19	–
15	21	–	–	–	–	–	–	–	217	21	–
16	21	–	–	–	–	–	–	–	217	17	–
17	21	–	–	–	–	–	–	–	217	20	–
18	20	–	–	–	–	–	–	–	217	22	–
19	20	–	–	–	–	–	–	–	217	21	–
20	20	–	–	–	–	–	–	–	216	26	–
21	20	–	–	–	–	–	–	–	216	25	–
22	20	–	–	–	–	–	–	–	216	28	–
23	20	–	–	–	–	–	–	–	216	22	–
24	20	–	–	–	–	–	–	–	216	23	–
25	20	–	–	–	–	–	–	–	216	27	–
26	20	–	–	–	–	–	–	–	216	21	–
27	20	–	–	–	–	–	–	–	216	28	–
28	20	–	–	–	–	–	–	–	216	32	–
29	20	–	–	–	–	–	–	–	215	29	–
30	20	–	–	–	–	–	–	–	215	27	–
31	20	–	–	–	–	–	–	–	215	27	–
1 August	20	–	–	–	–	–	–	–	215	27	–
2	20	–	–	–	–	–	–	–	215	28	–
3	20	–	–	–	–	–	–	–	215	30	–

DATE.	ESTABLLISHMENT.								CONVICTS.		
	Number Borne.	Number Sick.	Doing Duty at			Died.			Number Borne.	Number Sick.	Number Died.
			Thames.	Cassius.	Weymouth.	Thames.	Cassius.	On Shore.			
1853:											
4 August -	20	–	–	–	–	–	–	–	215	31	–
5 – -	20	–	–	–	–	–	–	–	215	27	–
6 – -	20	–	–	–	–	–	–	–	215	22	–
7 – -	20	–	–	–	–	–	–	–	215	23	–
8 – -	20	–	–	–	–	–	–	–	215	21	–
9 – -	20	–	–	–	–	–	–	–	215	27	–
10 – -	20	–	–	–	–	–	–	–	215	36	–
11 – -	20	–	–	–	–	–	–	–	215	25	–
12 – -	20	–	–	–	–	–	–	–	214	20	–
13 – -	20	–	–	–	–	–	–	–	214	19	–
14 – -	20	–	–	–	–	–	–	–	214	20	–
15 – -	21	–	–	–	–	–	–	–	214	23	–
16 – -	21	–	–	–	–	–	–	–	214	27	1
17 – -	21	–	–	–	–	–	–	–	213	28	–
18 – -	18	3	15	–	–	–	–	–	213	26	–
19 – -	18	3	15	–	–	–	–	–	213	29	–
20 – -	18	3	15	–	–	–	–	–	213	26	–
21 – -	18	3	15	–	–	–	–	–	213	26	–
22 – -	18	3	15	–	–	–	–	–	213	34	–
23 – -	18	3	15	–	–	–	–	–	213	42	–
24 – -	18	3	15	–	–	–	–	–	213	40	–
25 – -	18	2	15	–	–	1	–	–	213	39	1
26 – -	16	3	13	–	–	–	–	–	213	35	2
27 – -	16	8	8	–	–	–	–	–	211	45	–
28 – -	16	8	8	–	–	–	–	–	210	56	–
29 – -	16	8	8	–	–	–	–	–	210	64	–
30 – -	17	8	9	–	–	–	–	–	210	74	–
31 – -	17	8	5	3	–	–	–	1	210	93	1
1 September	14	5	4	3	–	–	–	2	209	100	3
2 – -	14	6	5	3	–	–	–	–	207	108	7
3 – -	14	6	5	3	–	–	–	–	200	114	5
4 – -	13	6	3	3	–	–	–	1	195	120	6
5 – -	14	6	5	3	–	–	–	–	202	112	8
6 – -	19	6	3	3	7	–	–	–	194	120	2
7 – -	19	6	2	3	8	–	–	–	192	92	3
8 – -	20	7	2	2	9	–	–	–	189	90	4
9 – -	20	7	2	2	9	–	–	–	185	85	5
10 – -	20	7	2	2	9	–	–	–	180	80	3
11 – -	20	7	2	2	9	–	–	–	177	50	3
12 – -	20	7	2	2	7	–	–	–	174	47	–
13 – -	20	9	2	2	7	–	–	–	174	48	3
14 – -	21	10	2	2	6	–	1	–	171	53	–
15 – -	20	10	2	2	6	–	–	–	171	52	–
16 – -	20	10	2	2	6	–	–	–	171	46	–
17 – -	20	11	2	2	5	–	–	–	171	40	–
18 – -	20	10	2	2	5	–	1	–	170	40	1
19 – -	19	10	2	2	5	–	–	–	169	39	–
20 – -	18	5	2	2	9	–	1	–	169	37	1
21 – -	18	5	2	2	9	–	–	–	168	27	–
22 – -	18	4	2	2	10	–	–	–	151	25	1
23 – -	18	4	2	2	10	–	–	–	151	21	–
24 – -	17	3	2	2	10	–	–	–	150	18	1
25 – -	17	3	2	2	10	–	–	–	150	18	–
26 – -	17	3	2	2	10	–	–	–	150	21	–
27 – -	17	3	2	2	10	–	–	–	150	15	1
28 – -	17	3	2	2	10	–	–	–	149	16	–
29 – -	17	3	2	2	10	–	–	–	149	15	–
30 – -	17	3	2	2	10	–	–	–	149	17	–
1 October -	16	1	2	2	11	–	–	–	149	10	–
2 – -	16	1	2	2	11	–	–	–	145	9	–
3 – -	16	1	2	2	11	–	–	–	145	13	–
4 – -	16	1	2	2	11	–	–	–	144	7	1
5 – -	16	1	2	2	11	–	–	–	144	12	–
6 – -	16	1	2	2	11	–	–	–	142	7	–
7 – -	16	1	2	2	11	–	–	–	142	11	–
8 – -	16	1	2	2	11	–	–	–	142	5	–

(*continued*)

Appendix.

Answers of Mr. J. B. Howes.

DATE.	ESTABLISHMENT.								CONVICTS.		
	Number Borne.	Number Sick.	Doing Duty at			Died.			Number Borne.	Number Sick.	Number Died.
			Thames.	Cassius.	Weymouth.	Thames.	Cassius.	Weymouth.			
1853:											
9 October -	16	1	2	2	11	–	–	–	142	5	–
10 – -	16	1	2	2	11	–	–	–	142	11	–
11 – -	16	1	2	2	11	–	–	–	142	8	–
12 – -	17	–	2	2	13	–	–	–	142	13	–
13 – -	17	–	2	2	13	–	–	–	142	9	–
14 – -	4	–	–	–	4	–	–	–	6	–	–
15 – -	4	–	–	–	4	–	–	–	6	–	–
16 – -	4	–	4	–	–	–	–	–	6	–	–
17 – -	4	–	4	–	–	–	–	–	6	–	–
18 – -	4	–	4	–	–	–	–	–	6	–	–
19 – -	4	–	4	–	–	–	–	–	6	–	–
20 – -	4	–	4	–	–	–	–	–	5	–	–
21 – -	4	–	4	–	–	–	–	–	5	–	–
22 – -	4	–	4	–	–	–	–	–	5	–	–
23 – -	4	–	4	–	–	–	–	–	5	–	–
24 – -	4	–	4	–	–	–	–	–	5	–	–
25 – -	4	–	4	–	–	–	–	–	5	–	–
26 – -	4	–	4	–	–	–	–	–	5	–	–
27 – -	4	–	4	–	–	–	–	–	5	–	–
28 – -	4	–	4	–	–	–	–	–	5	–	–
29 – -	4	–	4	–	–	–	–	–	5	–	–
30 – -	4	–	4	–	–	–	–	–	5	–	–
31 – -	4	–	4	–	–	–	–	–	5	–	–
1 November	4	–	4	–	–	–	–	–	5	–	–
2 – -	4	–	4	–	–	–	–	–	5	–	–
3 – -	4	–	4	–	–	–	–	–	5	–	–
4 – -	4	–	4	–	–	–	–	–	5	–	–
5 – -	4	–	4	–	–	–	–	–	5	–	–
6 – -	4	–	4	–	–	–	–	–	5	–	–
7 – -	4	–	4	–	–	–	–	–	5	–	–
8 – -	4	–	4	–	–	–	–	–	5	–	–
9 – -	4	–	4	–	–	–	–	–	5	–	–
10 – -	4	–	4	–	–	–	–	–	5	–	–
11 – -	4	–	4	–	–	–	–	–	5	–	–
12 – -	4	–	4	–	–	–	–	–	5	–	–
13 – -	4	–	4	–	–	–	–	–	5	–	–
14 – -	4	–	4	–	–	–	–	–	5	–	–
15 – -	4	–	4	–	–	–	–	–	5	–	–
16 – -	4	–	4	–	–	–	–	–	5	–	–
17 – -	4	–	4	–	–	–	–	–	5	–	–
18 – -	5	–	5	–	–	–	–	–	25	–	–
19 – -	5	–	5	–	–	–	–	–	25	–	–
20 – -	6	–	6	–	–	–	–	–	25	–	–
21 – -	6	–	6	–	–	–	–	–	25	–	–
22 – -	6	–	6	–	–	–	–	–	25	–	–
23 – -	6	–	6	–	–	–	–	–	25	–	–
24 – -	6	–	6	–	–	–	–	–	25	–	–
25 – -	6	–	6	–	–	–	–	–	25	–	–
26 – -	6	–	6	–	–	–	–	–	25	–	–
27 – -	6	–	6	–	–	–	–	–	25	–	–
28 – -	6	–	6	–	–	–	–	–	25	–	–
29 – -	6	–	6	–	–	–	–	–	25	–	–
30 – -	6	–	6	–	–	–	–	–	25	–	–
1 December	6	–	6	–	–	–	–	–	25	–	–
2 – -	6	–	6	–	–	–	–	–	25	–	–
3 – -	6	–	6	–	–	–	–	–	25	–	–
4 – -	6	–	6	–	–	–	–	–	24	–	–
5 – -	8	–	8	–	–	–	–	–	25	–	–
6 – -	8	–	8	–	–	–	–	–	25	–	–
7 – -	8	–	8	–	–	–	–	–	25	–	–
8 – -	8	–	8	–	–	–	–	–	25	–	–
9 – -	8	–	8	–	–	–	–	–	25	–	–
10 – -	8	–	8	–	–	–	–	–	25	–	–
11 – -	8	–	8	–	–	–	–	–	25	–	–
12 – -	8	–	8	–	–	–	–	–	25	–	–
13 – -	8	–	8	–	–	–	–	–	25	–	–

Appendix.

Answers of Mr. J. B. Howes.

DATE.	ESTABLISHMENT.								CONVICTS.		
	Number Borne.	Number Sick.	Doing Duty at			Died.			Number Borne.	Number Sick.	Number Died.
			Thames.	Cassius.	Weymouth.	Thames.	Cassius.	Weymouth.			
1853:											
14 December	8	–	8	–	–	–	–	–	25	–	–
15 – -	8	–	8	–	–	–	–	–	25	–	–
16 – -	8	–	8	–	–	–	–	–	25	–	–
17 – -	8	–	8	–	–	–	–	–	25	–	–
18 – -	8	–	8	–	–	–	–	–	25	–	–
19 – -	8	–	8	–	–	–	–	–	25	–	–
20 – -	8	–	8	–	–	–	–	–	25	–	–
21 – -	8	–	8	–	–	–	–	–	25	1	–
22 – -	8	–	8	–	–	–	–	–	25	1	–
23 – -	8	–	8	–	–	–	–	–	25	1	–
24 – -	8	–	8	–	–	–	–	–	25	–	–
25 – -	8	–	8	–	–	–	–	–	25	–	–
26 – -	8	–	8	–	–	–	–	–	25	1	–
27 – -	8	–	8	–	–	–	–	–	25	2	–
28 – -	8	–	8	–	–	–	–	–	25	2	–
29 – -	8	–	8	–	–	–	–	–	25	1	–
30 – -	8	–	8	–	–	–	–	–	25	–	–
31 – -	8	–	8	–	–	–	–	–	25	–	–

Memorandum.—Bedding, clothing, &c. burnt on the beach, 6th September 1853.

(signed) *B. Howes,*
Acting Overseer.

"Thames" Hulk, Bermuda, 22 April 1854.

STATEMENT of Mr. *Thomas Pearce*, Quartermaster of the Hulk "Thames."

I HAVE been quartermaster on board the "Thames" hulk for the last three years, and I was on board of her the whole time the fever raged in 1853. I know that the sanitary precautions directed by the Governor's letter in 1848 were, up to the time the sickness began, in August, regularly observed. I was in the "Coromandel," in the naval yard, in the fever of 1843. From the experience I had at that time, I am quite of opinion that Robert Hall (a convict who died on the "Thames" on the 16th) died of yellow fever. There were many cases on board when Mr. Howes took charge of her. I had charge of the "between decks," and I know she was clean, and that every precaution was taken down to the time the fever began to preserve health. No prisoner had been confined in the black-hole for more than a few hours for some time previous to the commencement of the fever (a month or more). I have no reason to believe that the fever was caused by the employment of the convicts between decks, or by any other work they had to do. In the gale of wind in August the position of the hulk was changed about six feet more in-shore; she worked a great deal during the gale. The mud and filth which surrounded the hulk was often cleared away, and was so in the last spring; there was less of it at the time of the gale than at former periods. The men who were attacked by fever were for the most part those of good behaviour and character. During the months of June and July several of the convicts were severely attacked with cholera. I remember no change of prisoners or guards for some time previous to the outbreak of the fever. There was no frequent intercourse between the "Thames" and Boaz Island; perhaps about once a week a boat would come for the sick, or on other duty. When the fever became so bad, the sick-bay was overcrowded, and the patients had to lie along the decks.

Appendix.

Answers of Mr. J. B. Howes.

STATEMENT of the Establishment and Convicts, showing the Number Borne, Sick, and Died, &c. &c., from the 18th August to 13th October 1853.

DATE.	ESTABLISHMENT.								CONVICTS.		
			Doing Duty at			Died.					
	Number Borne.	Number Sick.	Thames.	Cassius.	Weymouth.	Thames.	Weymouth.	On Shore.	Borne.	Sick.	Died.
1853:											
18 August	18	3	15	–	–	–	–	–	213	26	–
19 –	18	3	15	–	–	–	–	–	213	29	–
20 –	18	3	15	–	–	–	–	–	213	26	–
21 –	18	3	15	–	–	–	–	–	213	26	–
22 –	18	3	15	–	–	–	–	–	213	34	–
23 –	18	3	15	–	–	–	–	–	213	42	–
24 –	18	3	15	–	–	–	–	–	213	40	–
25 –	18	2	15	–	–	1	–	–	213	39	1
26 –	16	3	13	–	–	–	–	–	213	35	2
27 –	16	8	8	–	–	–	–	–	211	45	–
28 –	16	8	8	–	–	–	–	–	210	56	–
29 –	16	8	8	–	–	–	–	–	210	64	–
30 –	17	8	9	–	–	–	–	–	210	74	–
31 –	17	8	5	3	–	–	–	1	210	93	1
1 September	14	5	4	3	–	–	–	2	209	100	3
2 –	14	6	5	3	–	–	–	–	207	108	7
3 –	14	6	5	3	–	–	–	–	200	114	5
4 –	13	6	3	3	–	–	–	1	195	120	6
5 –	14	6	5	3	–	–	–	–	202	112	8
6 –	19	6	3	3	7	–	–	–	194	120	2
7 –	19	6	2	3	8	–	–	–	192	92	3
8 –	20	7	2	2	9	–	–	–	189	90	4
9 –	20	7	2	2	9	–	–	–	185	85	5
10 –	20	7	2	2	9	–	–	–	180	80	3
11 –	20	7	2	2	9	–	–	–	177	50	3
12 –	20	7	2	2	9	–	–	–	174	47	–
13 –	20	9	2	2	7	–	–	–	174	48	3
14 –	21	10	2	2	6	–	1	–	171	53	–
15 –	20	10	2	2	6	–	–	–	171	52	–
16 –	20	10	2	2	6	–	–	–	171	46	–
17 –	20	11	2	2	5	–	–	–	171	40	1
18 –	20	10	2	2	5	–	1	–	170	40	1
19 –	19	10	2	2	5	–	–	–	169	39	–
20 –	18	5	2	2	9	–	–	–	169	37	1
21 –	18	4	2	2	10	–	–	–	168	27	–
22 –	18	4	2	2	10	–	–	–	151	25	1
23 –	18	4	2	2	10	–	–	–	151	21	–
24 –	17	3	2	2	10	–	–	–	150	18	1
25 –	17	3	2	2	10	–	–	–	150	18	1
26 –	17	3	2	2	10	–	–	–	150	18	–
27 –	17	3	2	2	10	–	–	–	150	21	–
28 –	17	3	2	2	10	–	–	–	150	15	1
29 –	17	3	2	2	10	–	–	–	149	16	–
30 –	17	3	2	2	10	–	–	–	149	15	–
1 October	16	1	2	2	11	–	–	–	149	17	–
2 –	16	1	2	2	11	–	–	–	149	10	–
3 –	16	1	2	2	11	–	–	–	145	9	–
4 –	16	1	2	2	11	–	–	–	145	13	–
5 –	16	1	2	2	11	–	–	–	144	7	1
6 –	16	1	2	2	11	–	–	–	144	12	–
7 –	16	1	2	2	11	–	–	–	142	7	–
8 –	16	1	2	2	11	–	–	–	142	11	–
9 –	16	1	2	2	11	–	–	–	142	5	–
10 –	16	1	2	2	11	–	–	–	142	5	–
11 –	16	1	2	2	11	–	–	–	142	11	–
12 –	17	–	2	2	13	–	–	–	142	13	–
13 –	17	–	2	2	13	–	–	–	142	9	–

Memorandum.—Bedding, &c. burnt on the Breakwater, September 6th.

"Thames" Hulk, Bermuda, 22 September 1853.

STATEMENT of the Establishment and Convicts, showing the Number Borne, Sick, Died, &c., from 18 August to 13 October 1853.

DATE.	ESTABLISHMENT.								CONVICTS.		
	Number Borne.	Number Sick.	Doing Duty at			Died.			Borne.	Sick.	Died.
			Thames.	Cassius.	Weymouth.	Thames.	Weymouth.	On Shore.			
1853:											
18 August -	18	3	15	–	–	–	–	–	213	26	–
19 – -	18	3	15	–	–	–	–	–	213	29	–
20 – -	18	3	15	–	–	–	–	–	213	26	–
21 – -	18	3	15	–	–	–	–	–	213	26	–
22 – -	18	3	15	–	–	–	–	–	213	34	–
23 – -	18	3	15	–	–	–	–	–	213	42	1
24 – -	18	3	15	–	–	–	–	–	213	40	–
25 – -	18	2	15	–	–	1	–	–	213	39	–
26 – -	16	3	13	–	–	–	–	–	213	35	2
27 – -	16	8	8	–	–	–	–	–	211	45	–
28 – -	16	8	8	–	–	–	–	–	210	56	–
29 – -	16	8	8	–	–	–	–	–	210	64	–
30 – -	17	8	9	–	–	–	–	–	210	74	–
31 – -	17	8	5	3	–	–	–	1	210	93	1
1 September	14	5	4	3	–	–	–	2	209	100	3
2 – -	14	6	5	3	–	–	–	–	207	108	7
3 – -	14	6	5	3	–	–	–	–	200	114	5
4 – -	13	6	3	3	–	–	–	1	195	120	6
5 – -	14	6	5	3	–	–	–	–	202	112	8
6 – -	19	6	3	3	7	–	–	–	194	120	2
7 – -	19	6	2	3	8	–	–	–	192	92	3
8 – -	20	7	2	2	9	–	–	–	189	90	4
9 – -	20	7	2	2	9	–	–	–	185	85	5
10 – -	20	7	2	2	9	–	–	–	180	80	3
11 – -	20	7	2	2	9	–	–	–	177	50	3
12 – -	20	9	2	2	7	–	–	–	174	47	–
13 – -	20	9	2	2	7	–	–	–	174	48	3
14 – -	21	10	2	2	6	–	1	–	171	53	–
15 – -	20	10	2	2	6	–	–	–	171	52	–
16 – -	20	10	2	2	6	–	–	–	171	46	–
17 – -	20	11	2	2	5	–	–	–	171	40	1
18 – -	20	10	2	2	5	–	1	–	170	40	1
19 – -	19	10	2	2	5	–	–	–	169	39	–
20 – -	18	5	2	2	9	–	1	–	169	37	1
21 – -	18	5	2	2	9	–	–	–	168	27	–
22 – -	18	4	2	2	10	–	–	–	151	25	1
23 – -	18	4	2	2	10	–	–	–	151	21	1
24 – -	17	3	2	2	10	–	–	–	150	18	–
25 – -	17	3	2	2	10	–	–	–	150	18	–
26 – -	17	3	2	2	10	–	–	–	150	21	–
27 – -	17	3	2	2	10	–	–	–	150	15	1
28 – -	17	3	2	2	10	–	–	–	149	16	–
29 – -	17	3	2	2	10	–	–	–	149	15	–
30 – -	17	3	2	2	10	–	–	–	149	17	–
1 October -	16	1	2	2	11	–	–	–	149	10	–
2 – -	16	1	2	2	11	–	–	–	145	9	–
3 – -	16	1	2	2	11	–	–	–	145	13	–
4 – -	16	1	2	2	11	–	–	–	144	7	1
5 – -	16	1	2	2	11	–	–	–	144	12	–
6 – -	16	1	2	2	11	–	–	–	142	7	–
7 – -	16	1	2	2	11	–	–	–	142	11	–
8 – -	16	1	2	2	11	–	–	–	142	5	–
9 – -	16	1	2	2	11	–	–	–	142	5	–
10 – -	16	1	2	2	11	–	–	–	142	11	–
11 – -	16	1	2	2	11	–	–	–	142	8	–
12 – -	17	–	2	2	13	–	–	–	142	13	–
13 – -	17	–	2	2	13	–	–	–	142	9	–

Total Number of Deaths from yellow fever:—Officers, 8 in number; Convicts, 63 in number.

"Thames" Hulk, Bermuda, 14 February 1854.

Appendix.

Answers of Mr. J. B. Howes.

Remarks.

September 4.—Received from Boaz Island Prisons, 1 quartermaster, 6 guards, and 13 convicts, of which 1 convict was taken sick on the 8th, and died on 20th; 1 convict on 10th, and discharged to duty on 21st; 1 guard and 1 convict on 11th, the guard discharged on 20th, the convict on 15th; 1 quartermaster sick on 12th, also 1 guard, the quartermaster discharged on 30th, the guard died on 19th; 1 guard on 13th, died on 14th; 1 guard taken on 14th, died on 18th; 2 convicts taken on the 16th, 1 died on 22d, the other to duty on 22d; 3 convicts taken on 18th, 1 died on 23d, 1 on 27th, the other to duty on 24th; 1 taken on 20th, discharged on 30th; 1 taken on 30th, died October 4th; 2 taken on 12th October, and sent to "Tenedos" on 13th.

September 6, 1853.—Destroyed by burning, 210 beds, 210 blankets, and 210 hammocks, besides a large quantity of prisoners' clothing.

(signed) *J. B. Howes*, Acting Overseer,
"Thames," St. George's.

18 February 1854.

"Thames" Hulk, 21 February 1854.

Sir,

I omitted to forward with my answers to the printed questions the distance of the ship from the shore, &c. I herewith send them for your information.

Distance from ship to cliff - - - - - - - - - -	165 feet.
Width of road - - - - - - - - - - -	26 "
Total distance to Parade Wall - - -	190 feet.

Height of cliff to road - - - - - - - - - -	58 feet.
Ditto from road to top of Parade Wall - - - - - -	14 "
Total Height - - -	72 feet.
Total Height of Ship from Water to ridge board of Housing - - - - - - -	40

Depth of Water round the "Thames" Hulk:

Starboard midships - - - - - - - - -	3½ feet.
Ditto - quarter - - - - - - - - - -	6 "
Ditto - bow - - - - - - - - - - -	6½ "
Larboard midships - - - - - - - - - -	12 "
Ditto - quarter - - - - - - - - - -	12 "
Ditto - bow - - - - - - - - - - -	7 "
Stern - - - - - - - - - - - - -	12 "

At nearly low water on 11th January 1854.

I have, &c.
(signed) *J. B. Howes*,
Acting Overseer.

S. Oakeley, Esq., Major 56th Regiment,
&c. &c. &c.

No. 26.

Answers of the Rev. *R. T. Tucker*, D.D., Garrison Chaplain.

Answers of the Rev. R. T. Tucker, D.D.

1. I have been chaplain to the Garrison of St. George's since 1839.

2. I had the clerical charge of the garrison in St. George's, throughout the fever of 1843.

3. On the 1st of September I visited a dying man, J. Gray Lyon, a guard from the convict hulk "Thames."

4. The man died. I presume this query is intended for a medical man.

5. A medical query, I presume.

6 My opinion is that it was imported into St. George's, from the hulks at Ireland Island.

7. No.

8. Communicable. The instances which lead to this opinion are too numerous to mention.

9. By being much in the same atmosphere with fever patients, persons at all predisposed or not acclimated, I consider, are almost sure to take yellow fever.

10. I am told that Mrs. Howes, the wife of the overseer of the "Thames," brought it from Ireland Island.

11 and 12.

Appendix.

Answers of the Rev. R. T. Tucker, D. D.

11 and 12. Unanswered.

13. I consider that the soldier's habit of resorting to the dirtiest parts of the town, particularly exposes him to the attack of epidemics.

14. The grog-shops in St. George's which the soldiers frequent, are generally situated in the closest and dirtiest parts of the town.

15. Unanswered.

16. I have been in St. George's since 1839, and throughout the year 1853.

17. The soil of St. George's is sandy and absorbent. St. George's is ancient, built before carriages were in use, and therefore composed of tortuous narrow lanes. It lies too low to drain, were it desirable to do so, by conveying filth into the harbour. The poor having no place of deposit for refuse, it lies about until removed to gardens, &c., by persons who find it an object to cart it away. The burial-ground used by the military was too full for further use, and the place allotted for burial at a late period of the fever was rocky, and I believe the cause of much disease among the troops, from the excessive labour in excavating the graves. It was almost impossible to dig the graves in either the old or the new burial-places, to a sufficient depth in time for interments. In many, I may say in most cases, the men had to labour in the immediate neighbourhood of unburied bodies, and frequently in the rain.

The churchyard in the town is crowded, and ill situated in the midst of houses.

18. It is allowed to accumulate until it can no longer be endured, when it is removed and buried.

Regular cesspools are rare; where they exist they are cleaned out frequently.

19. The yellow fever raged here in 1819 and in 1843. Its native population has always suffered to a comparatively very slight degree.

20. Unanswered.

21. At an early stage of the fever tar barrels were burnt, and smoke created by brushwood set on fire in various parts of the town and churchyard, by order of the Board of Health.

22 and 23. Unanswered.

24. I consider the position of the "Thames" to windward of the most crowded part of the town, and just under the barracks, to have been highly conducive to the spread of the fever, if it can be communicated by contaminated air.

25. Certainly not, in my opinion.

26. A hot summer follows a rainy spring.

27. It was remarked in the early summer of 1853, that the weather very much resembled that of 1843; so much so, that some persons predicted that yellow fever would make its appearance. I myself noticed the resemblance in the luxuriant vegetation succeeding the rains of June.

28. Much more rain fell than is usual. The temperature was a little higher.

29. This is (I presume) a medical query.

30. The inhabitants are certainly more exempt than persons from northern climates, whether European or American.

31. I am doubtful on this point.

32. I think that yellow fever may be hastened or increased; I do not know whether originated here by the causes alluded to.

33. I do not know that any have been tried. I would recommend improving the ventilation of the town of St. George's by widening the streets, which are not worthy of the name, but are rather confined alleys.

34. The removal of every one with whom this is practicable from the infected place; in those who remain, an active temperate life should be promoted. Troops should be encamped in airy localities, not in a warm valley, as was the case in the late fever, when the women and children were placed in tents in the hospital field, under shelter of a cedar wood where the heat was intolerable, so that some were obliged, as they told me, to sleep outside.

35. I do not know that the late separation of the force arrested the disease in 1853.

36. Because it is scarcely within the yellow fever zone.

37. I suppose the natives who died from fever in 1853, as compared to Europeans, were not more than in the proportion of three per cent.

38. The corporation of St. George's being insolvent, and therefore inefficient, no effectual sanitary improvements can be expected from that quarter. I consider

Appendix.

Answers of the Rev. R. T. Tucker, D.D.

sider, therefore, that the widening of the streets, so necessary for the prevention of miasma settling and accumulating, the removal of dilapidated buildings, and the general improvement of the town, can only be effected by colonial grants, which, if judiciously applied, would prove beneficial, not only to St. George's, but to the colony at large. If the town, which most strangers usually see first, were rendered more attractive than it is, the character of Bermuda generally would be raised, and by its becoming the resort of more visitors in search of health and amusement, the health of the people would be increased, and their means, together with their taste for local improvements, be proportionably extended.

I think the convict hulk should never be replaced near the shore, but remain where it now is, in the centre of the harbour.

I think a law should be made prohibiting more than a certain number of persons from living or sleeping in a given space in the houses in the town.

I think the number of persons sleeping in each barrack-room, in summer at least, should be reduced; and if there be any appearance of fever, that the beds in the hospitals should be placed further apart than usual instead of closer, as has been the practice.

I think there should be some amendment in the laws relating to the sale of liquors in licensed as well as unlicensed houses. The grog-shops are nests of disease, poverty, and filth.

(signed) *R. T. Tucker*, D.D.,
St. George's, 24 February 1854. Garrison Chaplain.

No. 27.

Answers of the Corporation of *St. George*.

Answers of the Corporation of St. George.

1. Unanswered.

2. That in every instance such diseases have been imported, and when so introduced in the warm seasons, they have generally become epidemic.

3. The first cases in the town of St. George were brought from the convict ship "Thames;" four of the guards were taken with the fever, and sent to their families residing in the town, three of which proved fatal, and were decided cases of black vomit. There had been no case of fever previous to the above, within the town, but very soon after there were many.

4 and 5. Unanswered.

6. We are of opinion that the fever assumed various phases in consequence of its being introduced into the islands in several different vessels.

7. We are of opinion that the fever would not have become so general, and would have been less fatal at St. George's if prompt measures had been taken in the first instances, by separating afar the sick from the healthy, both as regards convicts and troops, so soon as practicable; viz. by putting the convicts in another vessel, and vacating the barracks, having them thoroughly fumigated and cleansed, as was done in the year 1843. But in this case it was not done until a great number of cases and deaths in both departments had occurred, nor were the barracks or hospitals cleansed for several months after.

8. We undoubtedly believe that it is communicable. Very many instances confirm us in that opinion. That of Mrs. Cooper attending her son, ill with fever, we know, has already been quoted for your consideration by several persons who have replied to this question, and we add the undoubted fact of (European) attendants on fever patients dying in rapid succession.

9. By inhaling the breath of the patient; and this belief makes us of opinion that the addition of each patient to the "sick bay" of the "Thames," or to the hospital, added "fuel to the fire," and rendered the disease more unmanageable. Hence the imprudence of the delay in removing the sick to a spot far distant from the healthy. We also believe that it can be communicated by the infected air of rooms, ships, &c.

10. We are of opinion that the fever was introduced into the parish more directly by the steamer "Merlin" from St. Thomas's (though we have reason to believe that other vessels arrived in the islands from infected ports). A lady passenger died on board the said steamer, and was buried in this town on June 25th. The wife of the pilot at St. David's Island, and another woman at his house, with others

Answers of the Corporation of St. George.

others living on the said island, were the first persons in this parish who were attacked with fever. On the 2d August, Samuel Fox died there with black vomit; this was about a fortnight before the fever reached the hulk "Thames," in St. George's. We learn also from good authority that several deaths occurred at the naval yard prior to 16th August, which was about the time of its first appearance in said hulk. The communication between naval yard, St. David's Island, and the hulk "Thames" was very frequent.

11. We are of opinion that such "specific miasma" does not exist in the neighbourhood of this town, of sufficient strength, or of such pernicious quality as to render the production of zymotic diseases.

12. Unanswered.

13. Nothing more in the situation of the soldier than in that of any other individual, not a native.

14. Unanswered.

15. The Royal Barracks, where the greater part of the troops are located, are situated on an eminence, and have the advantage of ocean breezes on nearly all sides, and we consider that there is not a more healthy situation in these islands. The localities, capacities, conveniences, and general eligibility of the hosiptals at St. George's, are unexceptionable; the regimental hospital particularly so, being a fine large building, and close to the water-side, on the north part of this island.

16. Unanswered.

17. Soil porous, and particularly rapid in its absorption of moisture. The town of St. George is situated to the west, below the barracks. Most of the forts are at some considerable distance from it; its principal drainage runs into the harbour; precautions to keep the lanes and back yards clean are generally taken, but provision has of late been made by the parish for a more systematic cleansing of the same. The extent and influence of the tides good, there being a diurnal ebb and flow between four and five feet of our particularly crystal clear waters, and sweeping through several outlets, westerly, easterly, and southerly. Situation of the burial-ground decidedly bad; though but few cases of fever occurred in its immediate vicinity. Slaughter-houses at the water's edge. The new slaughter-house (and one most in use) is a pattern of neatness and cleanliness. Pigs were occasionally kept in the town, and also near the mess-room. We do not consider that fever can have been engendered by any of these evils (for although evils, they are but comparatively of small extent), however much fever may be aggravated by them after it has once made its fatal appearance.

18. Nearly every dwelling-house in the town of St. George has a "necessary" attached, and the night-soil is so disposed of, and these are generally kept in a proper state by being periodically emptied, and the contents buried in deep pits and covered over with earth.

19. Yellow fever has visited these islands three times only during the last 34 years in the form of epidemic, and at no time has it appeared to be so generally fatal to natives as to others.

20. Unanswered.

21. The Corporation, as a board of health, were active in going through the town, and causing it generally to be cleansed from all offensive matter previous to any disease showing itself, and continued this repeatedly all through the summer months, and during the presence of the fever, as far as practicable.

22 to 24. Unanswered.

25. We think not.

26. The winds prevailed during the fever in 1843 and 1853 from the east, and we should say that a damp atmosphere and hot temperature after heavy rain are most favourable to spread of yellow fever.

27. Unanswered.

28. The temperature was not higher generally in 1853 than former years. Rain fell very heavily through the hot months.

29. The fever of 1853 was observed to affect Europeans, without regard to the sickly or healthy, moral or immoral, stout habits or meagre, living in badly-ventilated houses or well-ventilated.

30. The inhabitants, white and coloured, of this climate appear to be generally more exempt from yellow fever and other contagious diseases than most others,

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Answers of the Corporation of St. George.

others, and this has been manifest not only while at home, but also abroad in other climes.

31. It is.

32. We do not think that yellow fever or any contagious disease would ever be produced here under such circumstances, but when imported, we believe that during the warm months and certain states of the atmosphere then existing, would be favourable to such disease spreading through the island.

33. Unanswered.

34. Change of locality, particularly for the military.

35. We refer to the 7th answer for all we would say to this, except that we believed it would sooner have had a beneficial result if the move had been more promptly made.

36. From its central position in the Atlantic.

37. Unanswered.

38. That native nurses be employed at any future occurrence of a similar nature. We think this of such great importance, as the natives are so unlikely to take the disease, and at the same time have great skill in the management.

39. State as accurately as you can the number of cases of yellow fever which occurred amongst the inhabitants of your parish between 1st July and 31st December 1853, and the number of such persons who died of that disease within that period, exclusive of persons on the naval, military, and convict establishments, and furnish a nominal roll?—We cannot state with accuracy the number of cases, but we subjoin the following list of deaths which occur between 4th September and 5th November.

Not Natives.

Mr. Cusack.
Mrs. Cusack and child.
Mr. Beattie and child.
Mr. Juffs.
Mrs. Ranshaw and two sons.
Mrs. Hunter.
Mrs. Southworth.
Mr. Golway.
Mr. Murray and four children.
Mrs. Herbert.
Mr. Rowlandson.
Mr. Pherson.
Ingles' boy.
Shewbridge.
Mr. Herbert and child.
Mr. Edwards.
Mrs. Edwards and daughter
Mr. Howden (U. S. C.)
Mrs. Coventry.
Lucy Ellis.
Mrs. Holden and daughter.

Natives.

Samuel Fox.
Jane Fox.
Francis Skelly.
Mr. Cooper.
Mr. Calvy.
Samuel Brangman.
Miss Richardson.
Miss Penno (child).
Miss Smith.
Minors (coloured child).
John Gibson (child).
Samuel Taylor (coloured child).
Miss Agnes Tucker (child).
Miss Russel.
Hayward (child).
A coloured child.
Lyndhurst Harvey.
Burcher (child).
Lightbourne (child).
Two coloured children.
R. Hayward (child).
Miss Lamb.
Barham (coloured child).
M'Kenny (coloured child).

40. Are you aware of any infringement of the quarantine laws during that period; and if so, state the particulars?—Unanswered.

We, the undersigned committee of the corporation of St. George's, have appended answers to 27 of the foregoing questions, and now submit them for consideration.

(signed) *John Fox.*
George S. Rankin.
W. J. Outerbridge.
Robert W. Outerbridge.
R. L. Brown.

27 March 1854.

No. 28.

Answers of the Corporation of *Hamilton.*

Answers of the Corporation of Hamilton.

1. We are not in Her Majesty's service as is here meant, but a corporation, and Board of Health for the town of Hamilton.

2. We had the yellow fever here in 1796, 1818, 1819, 1843, and 1853, as an epidemic. In other years yellow fever has been brought here; but from being rigidly

Answers of the Corporation of Hamilton.

rigidly quarantined, no evil consequences resulted from it. Such, however, seldom occurred.

3. The first case in Bermuda did not come under our observation.

4. The case originated in St. George's, but we know no more of it.

5. None of the corporation are physicians; consequently we have no practice to speak of.

6. We have no evidence to give, as to the origin and nature of the late epidemic.

7. We have nothing to say in this respect.

8. We think it communicable. A member of the present corporation was taken down with yellow fever two days after having assisted to coffin a child, who had died about 12 hours before of that disease. A young man living in St. George's had the yellow fever there, and died from it. His father and mother living in Southampton parish, distant from St. George's about 15 miles, went to see him. After his death they went back again to Southampton, and soon after the mother was taken down with yellow fever, and died in one week from the death of her son. She also had three daughters living with her, who took the yellow fever, one of whom died. These were natives, and there was no case of yellow fever in the neighbourhood prior to their having it. The corporation member was also a native.

An American whaler put into St. George's during the yellow fever; several of her crew, after remaining there for about a week, came to Hamilton, and soon after two of them were taken with yellow fever and died; one of them died in our hospital, and was one of the first cases sent there by the corporation.

Mr. Falconer, of Scotland, living in Hamilton, went to St. George's during the fever to visit a friend there, and after staying there a few hours came back again to Hamilton, and was taken down with yellow fever, and died.

We could name many others, but we think it unnecessary, as those referred to being, in our opinion, sufficient to establish that yellow fever is communicable.

9. By attending and visiting persons sick with yellow fever, or visiting them too soon after their illness, or during their convalescence.

10. See No. 6.

11. We think it may produce the cause for yellow fever being generated here.

12. We have no knowledge of this.

12. Except from aggregation and from not being a native, we do not see any thing in the situation of a soldier rendering him more than usually susceptible of an attack of yellow fever.

14. When the yellow fever broke out among the soldiers at Hamilton, the sick were removed from the well, and the well were relieved from it, by going to another place distant from Hamilton about two miles.

15. We are acquainted with no particulars in the localization of the troops at that place, which could affect them unfavourably or otherwise; neither are we particularly acquainted with the hospitals alluded to.

16. *See* No. 1.

17. This question can be better answered by the corporation of St. George's for St. George's, than by us.

With respect to Hamilton, the barracks occupied by the soldiers are situated in the eastern part of the town of Hamilton, near the sea. The water from the streets of Hamilton is all carried off by surface drains to sunken pits, in connexion with the sea water, made for the purpose of receiving it.

The streets are all 50 feet wide, and are kept clean by corporation regulations. We have no burial-ground in the town, and but one slaughter-house in it, where but few cattle are weekly slaughtered. Pigs are sometimes kept in the town, one here and there to a family. The tides ebb and flow throughout the year from three to five feet. There are no lanes, small houses, back yards, kept in a filthy state, that we know of. In the late fever we found but little to remedy in this way. In fact the inhabitants generally are comfortably situated, and keep all about them clean and in good order. We know of no circumstance bearing upon the probability of fever being engendered or aggravated by the situation and condition of the town of Hamilton.

18. The houses in the town of Hamilton have cesspools for receiving night-soil; we cannot say how often they are cleaned out; in the early part of the

fever

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Answers of the Corporation of Hamilton.

fever the corporation required the owners of them to do so, or cover them over with earth mixed with lime or chloride of lime, which was done.

19. This question can be better answered by the corporation of St. George's than by us.

20. We have no evidence.

21. On the fever breaking out in the town of Hamilton, we provided a hospital for the indigent poor, which went into operation on the 1st October; 16 persons were sent there, of whom seven died. Everything necessary was provided for them: physician, nurses, medicine, and nourishment. By this means we think the progress of the fever in Hamilton was very much arrested. The parish of Pembroke, in which Hamilton is situated, also had the benefit of the hospital, but they had but few such cases to send there.

22. We have no evidence.

23. We have no means of doing so.

24. We have no evidence.

25. We know of none at present; many years ago the typhus fever was almost an annual fever of the colony; but of late years little or nothing has been heard of it.

26. When yellow fever prevails, we think the east wind most favourable to the spread of it.

27. The only means of reference we have are the meteorological tables kept at Mount Langton, and published here weekly; but they become of little value for this purpose, from the unsystematic way of keeping them.

28. The temperature of 1853, during the hot weather, we think, was higher than is usually the case during the same season, and decidedly we had more rain in that time than usual.

29. As a class of persons, the white are more predisposed to fever than the blacks; and strangers coming amongst us more so than natives, and among natives children more so than adults.

30. The inhabitants of the colony are more exempt from yellow fever than Europeans. As to the particular difference spoken of, we have never directed our attention particularly to the consideration of it, otherwise than is stated in our answer to No. 29.

31. We are decidedly of opinion that in every one of the cases mentioned it can be communicated.

32. We have no evidence to give.

33. In 1843, when the soldiers quartered at Hamilton were dying from yellow fever, they were relieved from it by being dispersed about the island; some were sent to Devonshire College, some to Tucker's Island, and others to Port's Island; they had but few cases among them after that. Next to dispersion, the removal of the sick from the well is absolutely necessary, as we have already stated to be our opinion in reference to our town hospital, in answer to question No. 21. As a general measure for prevention, we recommend rigid quarantine regulations.

34. Dispersion as practised in 1843 and 1853, and the removal of the sick from the well. This we apply particularly to soldiers, sailors, and convicts. With respect to the island generally, we recommend the enactment of regulations giving full power to the Governor for the time being to constitute and appoint a Board of Health for the whole island (he being one of the Board), whenever yellow fever breaks out in the colony. We also recommend the establishment of a lazar-house at the public expense, where the indigent poor of the colony may be sent for medical assistance at such times, and where also may be sent persons quarantined with yellow fever or other infectious diseases, so that a system for arresting the spread of infectious diseases may be made to apply alike to every one.

35. *See* Answer to No. 33.

36. Because we think it is not a fever of the climate of Bermuda; where it is so, it would more regularly and frequently appear among us than it does.

37. We do not know by account, but we know but few natives died of the late fever.

38. Open air in the daytime, and well-ventilated rooms in the night, are matters of essential importance for preserving the health of soldiers, sailors, and convicts, living together in numbers. They should sleep in no room, during the summer months in particular, that is not well ventilated; for if there be a

Answers of the Corporation of Hamilton.

tendency in the atmosphere to cause the production of yellow fever, how is it possible for 40 men sleeping in a room just large enough for their accommodation, in one of those still summer nights, with the thermometer at 85°, to avoid abstracting from the atmosphere the poison which it contains, if they be forced, for the want of ventilation, to breathe portions of the same air over and over again? The vigour and promptitude of their lungs may successfully repel the poison from them for a while, but in every renewed effort to do so they become less and less able to do it. Hence, when a fever breaks out in barracks, the rooms of them in succession become contaminated with a fever atmosphere, which, when well established, is sure to destroy a large proportion of those inhabiting them, if they remain there. The ventilation we recommend is for the rooms of our barracks, gaols, and hospitals to be so constructed as to pass off from the tops of them the warm rejected air of the lungs as it ascends, while they permit the introduction of a fresher and purer air below to take the place of it. We need hardly remark, the one cannot escape unless it be displaced by the other. For the escape of the warm air, ventilators such as are used on the tops of our asylum buildings for insane persons would answer the purpose; and for the admission of the fresh air, we would recommend the use of a wire gauze net, sufficiently open for admitting air without letting it in, in currents, to be put in sashes instead of glass; and also, if necessary, doors may be pannelled of the same material. The soldier's tent is ventilated from top to bottom. Besides that, it is made of a material which allows rarefied air to escape from it; and because it is so, it becomes perhaps their best refuge from yellow fever. The hulks may be ventilated by pipes leading through their decks.

By order of the Board,

Hamilton, Bermuda, (signed) *Henry James Tucker*,
16 February 1854. Mayor.

No. 29.

Answers by the Vestry of *St. George's.*

Answers by the Vestry of St. George.

1. Unanswered.

2. The general healthfulness of these islands, and the infrequency of any epidemic visitations, renders a relation of them almost impracticable.

3 to 5. Unanswered.

6. We are of opinion that it was imported.

7. No.

8. We do think it communicable, and instances too numerous to mention.

9. By inhaling the atmosphere of the deceased, and by close contact of a fever patient.

10. From the naval yard.

11 to 14. Unanswered.

15. The marshes near Prospect Hill, said hill being about a quarter of a mile west of Devonshire Marsh, and half a mile east of Pembroke Marsh, and about 80 feet above them, producing miasmatic inhalation destructive to full-blooded Englishmen.

The localities, capacities, conveniences, and general eligibility of the hospitals at Ireland Island and St. George's, are unexceptionable.

16. Unanswered.

17. Chemical knowledge being essential to reply to a question of such importance, we must leave it to abler hands. The situation of the town is a delightful one, and the barracks insurpassable; they are distant from the Atlantic less than a quarter of a mile, and about 80 feet above it, and immediately over the harbour, through which a strong current always sets, from three separate sources, producing ingress and egress to ships of heavy burden. The circumstance of a company of royal artillery having been quartered here for years without losing a man is indisputable evidence of locality and climate. The means of draining the forts and town can be better known on application to the Engineer office.

We believe that the houses, lanes, and back yards require precautionary measures. The rise and fall of the tide being only three feet six inches generally, we

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Answers by the Vestry of St. George.

we do not attribute any influence of a pernicious tendency. We consider the burial-ground improperly situated. The situation of the slaughter-houses being over the water, we do not consider them deleterious. The number of cattle vary according to the number of troops in barracks. Pigs are kept in the town, and near the officers' mess-room.

18. In this town it is generally buried; very few houses have cesspools.

19. Twice only has St. George's been visited with epidemic diseases, in 1819 and 1843. In other parts of the island epidemics raged in 1795, 1818, 1819, 1828, 1837, 1843.

20. Unanswered.

21. The town was fumigated repeatedly, and visitations were made by the Board of Health for cleansing the town. The separation of the forces in 1853 being made at too late a date, appears to have been productive of no good effect.

22 to 24. Unanswered.

25. We do not consider fever of any kind endemic to Bermuda.

26. Moderate east winds and high temperature.

27. The weather of 1853 resembled very much that of 1843 in rain and temperature.

28. The temperature was higher than usual in 1853, and more rain supposed to have fallen than at that season of the year generally.

29. Refer to those who first proclaimed yellow fever here.

30. We think the natives are more exempt from yellow fever than Europeans, and the coloured more than the white population.

31. It is our opinion that it may be communicated by contact with the living and the dead, and possibly by articles of dress or bedding.

32. We think that yellow fever may be increased in unfavourable states of atmosphere.

33. No means of prevention have yet been discovered, that we know of, in any part of the world. Burning the bedding of the dead was adopted by the military here, alike, in our opinion, destructive to life and property.

34. Temperance, cleanliness, quiet, and immediate removal from the diseased district.

35. The fever in 1843 was quickly arrested by Dr. Teeven removing the troops to the ferry on the outbreaking of fever.

36. From our proximity to the gulf stream, and distance from the equator.

37. Unanswered.

38. The most material improvement we can suggest for the interest of this town is, in our opinion, the demolition of certain buildings in York-street, numbering but few, and possibly worth 1,000 *l.* This street connects with Government Garden, measuring about 200 by 250 feet in extent, which, if thrown open, would be a very desirable boon to the residents, by the removal of high stone-walls, giving free circulation of air, and rendering visible those exotic and eastern plants so highly prized in tropical climates. Our streets generally are confined, with numerous unsightly obstructions of imperfectly constructed and dilapidated steps, and an entire absence of architectural arrangement. A colonial grant, or Government loan, would be very acceptable to the parishioners.

The insolvency of our corporation, the absence of trade, the reduction of troops, all combine to render the improvement of the town impracticable among the citizens.

39. State as accurately as you can the number of cases of yellow fever which occurred amongst the inhabitants of your parish between the 1st July and 31st December 1853, and the number of such persons who died of that disease within that period, exclusive of persons on the naval, military, and convict establishments, and furnish a nominal list of those who died?—Eighty-five civilians.

40. Are you aware of any infringement of the quarantine laws during that period; and if so, state the particulars?—Unanswered.

(signed) *R. T. Tucker*, Chairman,
On behalf of the Vestry of St. George.

St. George's,
27 February 1854.

No. 30.

ANSWERS by the *Hamilton* VESTRY.

Answers by the Hamilton Vestry.

1 to 38. UNANSWERED.

39. State as accurately as you can the number of cases of yellow fever which occurred in your parish between the 1st July and 31st December 1853, and the number of such persons as died from that disease within that period, exclusive of persons on the naval, military, and convict establishments, and furnish a nominal list of those who died?—About 20 cases in this parish. No deaths.

40. Are you aware of any infringement of the quarantine laws during that period, and if so, state the particulars?—No.

To Major *Oakeley*, 56th Regiment.

Sir,

THERE has been a vestry meeting called for the purpose of returning answers to the various questions which you have done us the honour of proposing to us, and in answer we beg to state, that with the exception of the two to which replies are affixed, no two members present can exactly agree in opinion; but as their sentiments may be highly instructive and useful, they beg to state, that should you deem it advisable, they are willing to return answers singly to all the inquiries, provided you will ensure them ample remuneration from the Colonial Treasury or other sources for their trouble.

We have, &c.
(signed) *J. A. Roberts*,
Rector.

Vestry Room, Hamilton Parish,
12 January.

By order of the Vestrymen,
(signed) *P. B. Outerbridge*, V. C.

No. 31.

ANSWERS of the Members of *Smith's Parish* VESTRY.

Answers of the Members of Smith's Parish Vestry.

1. UNANSWERED.

2. In 1843, as well as in 1853, this colony was visited with an epidemic yellow fever. In some other years (not frequent) the disease was brought into the ports of these islands, but, from a rigid execution of the quarantine laws, it did not spread.

3. The first case of yellow fever in Smith's Parish occurred in the month of October 1853. It was a child of Mr. John W. Pearman.

4. The case originated at the residence of the child's father, situate near the parish church. It did not end fatally.

5. None of the vestry being physicians, have no practice to report.

6. We have no evidence on which to form an opinion as to the origin of the late epidemic.

7. Unanswered.

8. We think it communicable. We are confirmed in that opinion from the several cases reported during the prevalence of the disease in the colony last year (1853).

9. We consider it communicable by inhalation or contagion.

10. *See* Answer to the Question No. 6.

11. We think it may.

12. We are without any knowledge on this point.

13. Beyond aggregation, we do not know that the situation of the soldier would render him more susceptible of a fever attack than other natives of northern climates.

14. We are of opinion that when yellow fever appears in the barracks, that immediate dispersion of the men would be a salutary measure. When yellow fever exists in the neighbourhood of the barracks, we consider it would be wise to disperse the men as early as practicable, inasmuch as these means promptly adopted at the Hamilton garrison were productive of great good.

15. We are not acquainted with the particular localization of the troops at St. George's, which could unfavourably affect them. We think the barracks there

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Answers of the Members of Smith's Parish Vestry.

there admirably situated for the preservation of general health. The site of the Military Hospital at St. George's we also think an eligible one.

16. Unanswered.

17. This question, we consider, can be fully and better answered by the authorities of St. George's. We are of opinion the burial-ground in the town should be immediately abandoned.

18. We do not know, but are of opinion, that the houses in the town of St. George's should have cesspools, and that they should be periodically cleansed. We are further of opinion that the town of St. George requires ventilation, drainage, and other improvements of a sanitary nature.

19. This question can be better answered by the authorities of St. George's.

20. We are without evidence.

21. We are not aware of the nature of the means adopted to arrest the progress of the disease at St. George's.

22 to 25. Unanswered.

26. High moist temperature. Winds from the east and its collateral points are most favourable towards the spread of the disease.

27. We have not the means.

28. The temperature of the summer of 1853 was higher than is usually the case during the same season in other years. A very unusual large quantity of rain fell during the hot weather in 1853.

29. White persons are more predisposed to fever than black of coloured. Strangers more so than natives; and amongst natives, children suffer more than adults.

30. The inhabitants of the colony are more exempt from yellow fever than natives of northern climates.

31. We think it may be communicated by all the means detailed in this question, but chiefly by inhalation.

32. They may not originate, but may greatly assist in spreading infection.

33. We would suggest cleanliness and ventilation, and also the dispersion of men who are crowded together.

34. Separating the sick from the healthy, and dispersing the latter.

35. Separation of the force during the late epidemic appeared ultimately to be successful.

36. The natural salubrity of the climate.

37. We do not know.

38. Unanswered.

State as accurately as you can the number of cases of yellow fever which occurred in your parish between the 1st July and 31st December, and the number of such persons who died of that disease within that period, exclusive of persons on the naval, military, and convict establishment; and furnish a nominal list of those who died?—The number of cases of yellow fever which occurred in Smith's parish were as follows: 11 white persons, all children, one of whom died; five coloured persons, of whom four were children and one adult, all recovered.

Are you aware of any infringement of the quarantine laws during that period; and if so, state the particulars?—We do not know.

(signed) *Cornelius C. Hinson,*
W. E. Zuill,
W. E. Newman,
W. P. Pinostan,
Members of Smith's Parish Vestry.

No. 32.

Answers of the Members of *Devonshire* Vestry.

Answers of the Members of Devonshire Vestry.

1. The rector was appointed officiating clergyman to the troops in Hamilton in 1833.

2. We have to say, in answer to this question, that the fever in 1818 and 1819 was more fatal amongst the natives of Bermuda. Young persons from 15 to 20 years of age chiefly suffered. No military were stationed in this part of the country. In 1843, it was mainly confined to Europeans and the military.

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Answers of the Members of Devonshire Vestry.

3. The first case of yellow fever was a coloured man, by name John Henry Hall, a native of the United States of America, on the 17th October 1853. The first death was that of his son, Joseph Hall, aged 8 years, 2 months, and 14 days, on the 14th November 1853.

4. It occurred in this parish, Devonshire; the father recovered. Both were well-defined cases of yellow fever, as we were informed.

5. Unanswered.

6. We find it impossible to come to any decision upon this subject.

7. Unanswered.

8. We think that it is communicable. The cases of Soadey (Royal Sappers and Miners) and his wife, (both of whom died), Mrs. Freswell (who recovered) and her two children (one of whom died), and Miss Emily Cox (who recovered), residing as they all did in a house adjoining Prospect Hill, have confirmed us in this opinion.

9. Persons living crowdedly together, a high temperature, and an impure state of the atmosphere, we conceive, are the circumstances under which it may be communicable. We think that it may also be communicated in a pure atmosphere, by inhalation or contagion.

10. to 24. Unanswered.

25. In our belief, there is no fever endemic to Bermuda.

26. Moist atmosphere, high temperature, and easterly winds.

27. It is in the recollection of one of us, that in the summer of 1819 there was a continuance of dry weather until about September, when rain fell abundantly every day. The rector remembers that it was a dry and very warm summer in 1843, and that rain did not fall copiously until after the 15th October.

28. The temperature was higher, and more rain fell in 1853 than is generally the case during the same season.

29. Persons of plethoric habit of body, and natives of northern climates.

30. If we are to judge from the events of 1843 and 1853, we should say that the inhabitants of the colony are more exempt than Europeans. We believe the coloured people to be specially so, as a body.

31. We think that it may be communicated by all the means here enumerated, but chiefly inhalation.

32. They may not originate yellow fever, but they may assist in spreading infection.

33. We would suggest cleanliness and free ventilation.

34. Separation of the sick from the healthy, and dispersion of the latter, with a scrupulous regard to cleanliness.

35. Success appeared to attend the dispersion of the force.

36. The natural salubrity of the climate we think to be the cause.

37 and 38. Unanswered.

State as accurately as you can the number of cases of yellow fever which occurred in your parish between the 1st July and 31st December 1853, and the number of such persons who died of that disease within that period, exclusive of persons on the naval, military, and convict establishment, and furnish a nominal list of those who died?—Twenty-one cases, of which two children died. There was an adult in addition, said to be a doubtful case. Joseph Hall, buried 14th November 1853. Mary Freswell, buried 3d December 1853. The doubtful case was James Reeves, buried 12th November 1853.

Are you aware of any infringement of the quarantine laws during that period, and if so, state the particulars?—We are not aware of any infringement.

(signed)
J. F. Lightbourn, Rector.
H. W. Robinson.
Benjamin W. Cox.
E. B. Perot.
L. Griset, V. C.
Richard W. Tynes.
W. C. Tynes.
William J. Cox.
Richard J. P. Darrell.

Appendix.

No. 33.

Answers of the Members of *Pembroke* Vestry.

Answers of the Members of Pembroke Vestry.

1. The rector was appointed officiating clergyman to the troops in Hamilton in 1833.

2. In 1818 and 1819 the fever was more fatal amongst the natives, particularly among young people from 15 to 20 years of age. There were no military stationed on this side of the ferry at that time. In 1843 it was principally confined to Europeans and the military.

3. The first case of yellow fever in Pembroke parish occurred early in September 1853, among some children connected with a family who were known to have come from St. George's. The first death was that of a Portuguese, by name José Oliviera Mentz, who caught the fever in St. George's.

4. In Pembroke parish. The child recovered. The Portuguese was a well-defined case of yellow fever, as we were informed.

5. Unanswered.

6. We are of opinion (with the exception of the rector, who cannot make up his mind on the subject) that it was imported.

7. We (with the exception alluded to in the last answer) have continued in the same opinion, both before and since, namely, that it was imported.

8. We think that it is communicable, and we cite, in proof of its being so, the case of the Portuguese above mentioned.

9. Numbers of persons living together, a high temperature, and an impure state of the atmosphere are, we conceive, the circumstances under which it may be communicable. It may be communicated also in a pure atmosphere by inhalation or contagion.

10. We possess no accurate information on this point.

11 to 17. Unanswered.

18. It is our belief that the town of Hamilton is kept clean, and is generally in a healthy state.

19 to 24. Unanswered.

25. We are of opinion that there is no fever endemic to Bermuda.

26. Moist atmosphere, with high temperature and easterly winds.

27. We have no means of comparing them, further than that it is in the recollection of one of us that there was a continuance of dry weather in 1819 until about the end of August, when rain fell in great abundance, and that the rector remembers that the summer was dry and very warm in 1843, and that rain did not fall in any quantity until towards the end of October.

28. The temperature was higher, and more rain fell in 1853, than is usually the case during tbe same season.

29. Plethoric persons and natives of northern climates.

30. It is our opinion that the inhabitants of the colony, especially the coloured portion, are more exempt than Europeans and natives of other northern climates, judging from the events of 1843 and 1853.

31. We are persuaded that it can be communicated by all these means.

32. We do not conceive that they would produce yellow fever, but think that they may aid in spreading infection.

33. Cleanliness.

34. Dispersion, where large bodies of persons are congregated, and strict regard to cleanliness.

35. The result was ultimately successful.

36. From there not having been till of late years much intercourse with infected ports, and from the general salubrity of the climate. The rector, from the position in which his doubts have placed him, can only join (with any degree of decision) in the reason last given.

37 and 38. Unanswered.

State as accurately as you can the number of cases of yellow fever which occurred in your parish between the 1st of July and the 31st December 1853, and the number of such persons who died of that disease within that period, exclusive of persons on the naval, military, and convict establishments, and furnish

Answers of the Members of Pembroke Vestry.

furnish a nominal list of those who died?—About 26 who recovered, and 27 who died. The following is a nominal list of the latter:

NAME.	AGE.	COUNTRY.	BURIED.
José Oliviera Mentz	- - -	Of Madeira	3 Oct. 1853.
John A. Thompson	8 years	Native	5 – –
Samuel Wesley Hallett	4 yrs. 8 mths.	Native	5 – –
William Henry Gibbons	6 ,, 7 ,,	Native	8 – –
Sarah Cecilia Barss	9 years	Native	12 – –
James C. Falconer	26 ,,	Of Scotland	14 – –
Marie Fernandez	40 ,,	Of Madeira	15 – –
William Grant	39 ,,	Of England	18 – –
Stephen Simms	20 ,,	Of England	27 – –
George Prince	19 ,,	Of Halifax, N. S.	27 – –
Mary Anne Finlater	9 ,,	Native	28 – –
George Empson	18 ,,	Of London	30 – –
John Meaney	32 ,,	Of Ireland	31 – –
Daniel M'Coy	29 ,,	Of Scotland	31 – –
Jane Finlater	4 yrs. 3 mths.	Native	31 – –
John Shea	38 years	Of Halifax, N. S.	1 Nov. –
James Milne	32 ,,	Of Scotland	2 – –
George Finlater	6 ,,	Native	4 – –
José de Fratis	22 ,,	Of Madeira	8 – –
James George	17 ,,	Of London	9 – –
Thomas W. Day	19 ,,	Of London	11 – –
Rev. Thomas Lyon, R. C. P.	36 ,,	- - -	13 – –
William Akin	28 ,,	Of Canada	13 – –
Frederick Swainson	40 ,,	Of England	21 – –
Mary Adelaide Kirkham	22 months	Native	27 – –
Richard S. Peper	46 years	- - -	28 – –
Louisa Susan Kirkham	6 ,,	Native	1 Dec. –

Are you aware of any infringement of the quarantine laws during that period, and if so, state the particulars?—We are not aware of any infringement.

(signed) *J. F. Lightbourn,*
Rector.
Thomas F. Ewing,
James Turo,
Samuel Salters,
Joseph Wood,
Charles Keane,
N. T. Butterfield,
Thomas Newbold,
William B. Perot,
Samuel Watson,
Samuel Nash,
John Black,
A. J. Harvey,
Pembroke Vestry.

No. 34.

ANSWERS of the Members of *Paget* VESTRY.

Answers of the Members of Paget Vestry.

1 to 20. UNANSWERED.

21. Shortly after the appearance of the disease in St. George's, a meeting of the vestry of Paget parish took place, and measures were adopted for the purpose of having the houses cleansed and purified, and removing any filth that may be found in the parish, which were carried out between the 17th and 22d September.

22 to 27. Unanswered.

28. An unusual quantity of rain fell in 1853.

29. Unanswered.

30. Native residents appear less liable to yellow fever than persons from northern climates.

31 to 38. Unanswered.

State as accurately as you can the number of cases of yellow fever which occurred in your parish between the 1st July and 31st December 1853, and the number of such persons who died of that disease within that period,

Appendix.

Answers of the Members of Paget Vestry.

exclusive of persons on the naval, military, and convict establishments, and furnish a nominal list of those who died?—The persons reported to have died from yellow fever in our parish between the 1st July and 31st December 1853, are Elizabeth M'Ronald (parents Northerners), aged about 8 years; Sarah Walton (European), aged 56 years; John Adair (European), aged 36 years; Harriet Jones (European), aged about 11 years; Christina Jones (European), aged about 9 years; and Cecilia Barss (native, father a Northerner), aged about 10 years.

Are you aware of any infringement of the Quarantine Laws during that period, and if so, state the particulars?—With reference to this question, we can only state that on the 11th October a corpse was landed from the brig "Charles," from Demerary, anchored in the quarantine station at the West-end, and buried in the churchyard of this parish, said to be the wife of the captain, and to have died of yellow fever, although at the time of interment the rector was positively assured that the deceased had died of kidney complaint, and not of any infectious disease.

(signed) *M. K. S. Frith*, Rector.
T. M. D. B. Godet,
S. J. Ingham,
Samuel J. Smith,
Duncan M'Coll,
Edward H. Smith,
T. M. Jones,
Samuel S. J. Frith,
Henry J. Hinson, M. D.,
Vestry of Paget Parish.

No. 35.

ANSWERS of the Members *Warwick* VESTRY.

Answers of the Members of Warwick Vestry.

1 to 38. UNANSWERED.

State as accurately as you can the number of cases of yellow fever which occurred in your parish between the 1st July and 31st December 1853, and the number of such persons who died of that disease within that period, exclusive of persons on the naval, military, and convict establishments, and furnish a nominal list of those who died?—There has been no case of yellow fever in Warwick parish between the 1st July and 31st December 1853.

Are you aware of any infringement of the Quarantine Laws during that period, and if so, state the particulars?—Unanswered.

No. 36.

ANSWERS of the Members of *Southampton* VESTRY.

Answers of the Members of Southampton Vestry.

1 and 2. UNANSWERED.

3. The 17th day of September 1853.

4. It is believed that the first case originated from St. George's, in the case of Mrs. Isaac Cooper going there to visit her son, who died there with it, and ended fatal to herself and daughter, who died in this parish, of black vomit.

5. Unanswered.

6. We believe it was brought from abroad.

7. Unanswered.

8. We believe it is, as it went through two families in this parish.

9. From inhaling the breath of a person that is infected.

10 to 20. Unanswered.

21. There were not any restrictions.

22 to 25. Unanswered.

26. The south and east winds.

27. Unanswered.

28. It was a very hot summer, and more rain than usual.

29. The Northerners.

30. The inhabitants are more exempt.

31. It can be communicated either way.

32 to 35. Unanswered.

36. Owing

Appendix.

Answers of the Members of Southampton Vestry.

36. Owing to the climate being healthy.
37 & 38. Unanswered.

State as accurately as you can the number of cases of yellow fever which occurred in your parish between the 1st July and the 31st December 1853, and the number of such persons who died of that disease within that period, exclusive of persons on the naval, military, and convict establishments, and furnish a nominal list of those who died?—There were many cases recovered, and the number of deaths in Southampton parish were nine, and all were natives.

Are you aware of any infringement of the Quarantine Laws during that period; and if so, state the particulars?—Unanswered.

By order of the Vestry of Southampton Parish,

(signed) *Robert Hoare.* *Forster M. Cooper.*
W. Todd Cooper. *John D. Bell.*
13 January 1854. *James B. Harrison.* *James Watson.*

No. 37.

Answers of the Members of *Sandy*'s Vestry.

Answers of the Members of Sandy's Vestry.

1 and 2. Unanswered.

3. We learn that the first case occurred in this parish on the 12th September 1853.

4. The first case originated on the Glebe, in a man who had been to St. George's a few days before. He recovered.

5 to 30. Unanswered.

31. It has come to our knowledge that persons who had visited St. George's were seized with the fever soon after returning, and communicated it to their families.

32 to 38. Unanswered.

State as accurately as you can the number of cases of yellow fever which occurred in your parish between the 1st July and 31st December 1853, and the number of such persons who died of that disease within that period, exclusive of persons in the naval, military, and convict establishments, and furnish a nominal list of those who died?—We cannot state accurately the number of cases that have occurred in this parish. Two persons have died of yellow fever in this parish; one an European, aged 35, male; one a native, aged seven, male.

Are you aware of any infringement of the Quarantine Laws during that period; and if so, state the particulars?—We know of no infringement.

By order of the Vestry,

(signed) *Robert Hoare*, Rector.
R. F. Burrows, V. C.

No. 38.

Answers of the Rev. Mr. *Thorburn*, Presbyterian Minister.

Answers of the Rev. Mr. Thorburn.

I am a minister of the Gospel, and have been nine years in the service; nearly eight of these were spent in Jamaica.

2. I was in Edinburgh during the cholera epidemic of 1852; I think that is the date. I was also in Jamaica during the most fatal visitation of the same disease in 1850–51, and during the prevalence of small-pox in 1852. I came much in contact both with the cholera and small-pox patients in Jamaica, but chiefly in a professional capacity.

3. About the end of October.

4. In the town of Hamilton.

Appendix.

Answers of the Rev. Mr. Thorburn.

5 to 7. Unanswered.

8. My impression is, that the late prevailing disease was communicable, though I cannot mention particular instances.

9 to 38. Unanswered.

No. 39.

Answers of the Rev. *Isaac Whitehouse*, Wesleyan Missionary.

Answers of the Rev. I. Whitehouse.

1. I have resided in Jamaica 19 years, and seven years in the Bahamas. I arrived in Bermuda in July last.

2. Unanswered.

3. The first case that came under my personal observation occurred early in the month of September last.

4. The case referred to occurred at St. George's; the subject was a person of the name of Galway; his situation was that of constable. I understood that his habits were temperate. The case ended fatally. The patient vomited a considerable quantity of black matter during my pastoral visit, on the evening preceding his death.

5. Unanswered.

6. I am scarcely in a position to offer an opinion as to the origin of the disease, which I have no doubt was the yellow fever, of a most malignant type.

7 and 8. Unanswered.

9. In answering this and the preceding question, I would take leave to observe, that I have long been of opinion that the disease is communicable, especially when it assumes an epidemic form; and that various circumstances may occasion its spread, as close attendance on the patient, &c.

10. I am unable to arrive at a definite opinion upon this point.

11. I am of opinion, founded upon lengthy observation, that swampy situations, abounding with vegetable matter in a state of decomposition, can and do, under special circumstances, produce yellow fever.

12 to 30. Unanswered.

31. *See* my Answer to Question 9.

32. Decidedly so.

33. Cleanliness has doubtless tended to prevention, and it appears to me very desirable that the local authorities should be empowered, if they are not so already, to compel persons to pay proper attention to their dwellings and premises, where compulsion may be necessary, and that particular localities calling for especial attention in this respect should be visited by persons duly authorised periodically to report and obtain the removal of nuisances. Lime-washing of dwellings generally, and of those of the poor especially, periodically attended to, would conduce to health.

34 to 36. Unanswered.

37. I do not know the exact proportion; but the mortality amongst the natives during the recent epidemic has been small compared to that amongst Europeans.

38. Unanswered.

(signed) *Isaac Whitehouse*,
Wesleyan Missionary.

No. 40.

Answers of the Rev. *Patrick Phelan*, Pastor of the Roman-catholic Soldiers and Prisoners.

Answers of the Rev. P. Phelan.

1 and 2. Unanswered.

3. On the 19th of August; I did not know then it was yellow fever.

4. At Fort Cunningham, when called to visit the patient (a soldier's wife), I expected that she was suffering from cold, but when I saw her I was surprised and perplexed; apparently conscious of my presence, she neither spoke nor moved, and there was a something in the cast of her countenance unlike any patient I had previously seen. I anxiously inquired what the doctor said it was; I was

Answers of the Rev. P. Phelan.

I was told he said it was brain fever. She died on the 20th. It was currently believed at St. George's that that was the first case of yellow fever.

5. I was in constant attendance on the Roman-catholic prisoners and soldiers during the prevalence of the fever at St. George's. I also visited the other stations.

6 and 7. Unanswered.

8. I believe the fever is communicable. I saw prisoners waiting on their sick comrades, and who imagined that they were not liable to contagion, take it themselves and die.

9 to 15. Unanswered.

16. Since January 1852. As pastor to the Roman-catholic soldiers and prisoners.

17 to 38. Unanswered.

(Unsigned.)

No. 41.

Answers of *J. H. Trott,* Esq., Provost-Marshal General.

Answers of J. H. Trott, Esq.

1. Fifteen years as Provost-Marshal, during which time I have resided altogether in the colony, and for a long period prior to that, having been occasionally absent.

2. Unanswered.

3. About the 10th September 1853.

4. At St. George's, in the person of the superintendent of the prisoners at the gaol there, a European, who died of black vomit, after six days' illness.

5. Unanswered.

6. That it was imported, and that it is contagious in its nature.

7. I have never believed that it originated in the colony during its late or any former prevalence.

8. I do; and I am confirmed in that belief from the following circumstances: that the gaoler at Hamilton, a European, in whom it ended fatally, was attended by four persons, three of whom were Europeans and one a native. The three Europeans took the fever shortly after his death; it ended fatally in one; a second suffered severely; the third had it mildly; whilst the native escaped.

Again, Mrs. Cooper, who resided 13 miles distant from St. George's, visited there, and attended in the sick-room on her son, who died of the fever; on her return home she was seized with it and died, as did also another of her children.

9. By constant attendance on a patient sleeping in the same room, or by inhaling the unwholesome effluvia arising from foul clothes or a confined room.

10. Under the conviction that it was imported, I believe that it was introduced by the steamer "Merlin," on or about the 25th or 26th June 1853, on her arrival from the island of St. Thomas, at which place the yellow fever was prevailing; that steamer landed the dead body of a female at St. George's, which was buried in the churchyard of the town, and which person is said to have died of yellow fever. The same steamer, after landing her mail-bag, proceeded to Her Majesty's naval yard, Ireland Island, where she was coaled by convicts. The captain has given unsatisfactory accounts of his conduct after the death of his passenger, which induces the belief that the nature of the disease of which she died was of a contagious description.

I was in St. George's the morning the "Merlin" left the port, and much dissatisfaction was manifested on the part of the inhabitants at the loose manner in which that vessel was allowed to enter the harbour and bury that corpse. I am aware that fever is said to have existed at Boaz Island prior to that date; but I am firmly impressed in the belief that the "Merlin" imported it too.

11 and 12. Unanswered.

13. Exposure to night air, and the soldier being unaccustomed to the sudden changes of the climate, might be less careful of his dress, and thus render him more susceptible of fever.

14. Unanswered.

15. I do

Appendix.

Answers of J. H. Trott, Esq.

15. I do not think the locality of the troops can be altered for the better. The localities, capacities, and general eligibilities of the hospitals, both at St. George's and Ireland Island, are excellent, so far as my judgment leads me to believe.

16. I have never been stationed at St. George's, but have been in constant intercourse with the town for many years, more particularly since my official appointment; during the months of September and October was unusually called there on duty.

17. The Island of St George's, in which the town is situated, is bounded on the east and north by the ocean; the tides flow all around its shores, and leave little chance for the accumulation of filth. There is a strong current always running in at one point of the harbour, and out at the other, which materially assists, with the aid of the winds, in carrying off floating substances. The tides do not ebb sufficiently to render the smell from submarine substances offensive; there is a small portion of the beach in the neighbourhood of the "Thames" hulk which might, from continuous south winds, render that particular neighbourhood likely to aggravate disease by the filth from the ship floating directly ashore. The streets and lanes of the town are somewhat confined, but the town has by no means a crowded population, the entire number in the whole parish, with its adjacent islands, not exceeding 2,000, exclusive of the military; these latter, however, reside principally in the forts and barracks which overlook the town, the harbour, and the ocean, and are pleasantly and healthily situated. The means of draining the town can, I think, be easily effected, if needed. The chief burial-ground is the churchyard in the centre of the town, which is about to be abandoned. There are three small slaughter-houses, which are immediately over the waters of the harbour, and by which they appear to be kept clean. Pigstyes have been rather too common, and regulations for the prevention of them in future are under consideration. I do not believe that disease can be engendered in such a spot; there is no part of St. George's Island more than half a mile in breadth; its contiguity to the ocean, receiving, as it does, the freshness of its breeze and the lash of its waves, precludes the chances of it, when compared to the more inland town of Hamilton, where, from the prevailing south-west winds in the summer season, the filth from shipping, and more particularly that from the barracks, is swept down the harbour and lodged along the shores till it reaches the foot of the harbour, where in connexion with dead carcases, which are too frequently to be seen, and the peculiar location of that spot, situated under surrounding hills, with a dense foliage, amongst which are mangrove trees growing in a soft marshy substance, render that spot one to be guarded against. The smell from the barrack privy in the town of Hamilton (with the summer winds) makes an immediate impression on the nasal senses directly on your entrance to that town. I think it is a great reflection on the authorities to permit its existence in its present conspicuous spot, more particularly as it is located within 30 yards of a gentleman's dwelling-house, and within 12 or 14 yards of the front and main street.

18. Unanswered.

19. St. George's, as well as the main island, has been visited two or three times by yellow fever since 1818, and its mortality chiefly (on each occasion) confined to foreigners. Natives comparatively few.

20. Unanswered.

21. None that I am aware of, I regret to say, until it was too late. The "Thames" hulk had numbered its dead to an alarming extent before the convicts were removed from the hulk. The surgeon of that ship, who was also health officer of the port, in a letter, under date of 30th August, published in one of the journals, denied the existence of yellow fever; that letter, I believe, had a tendency to throw many persons off their guard, and thereby assisted instead of arresting its progress. That hulk lay immediately under the cliff of Barrack Hill, where the 56th was quartered, and not till one-fourth of the number of its convicts had died, and after 106 of the military were declared to be sick of fever (by the "Royal Gazette") did the removal of the head-quarters take place, and that date was about the 13th or 14th September; and had not certain portions of the military been transferred to Prospect Hill, I believe the disease would never have been felt in that neighbourhood. I cannot imagine worse management; such delays in future cannot be too strongly guarded against.

22 and 23. Unanswered.

Appendix.

Answers of J. H. Trott, Esq.

24. I am unable to answer the first part of this question. With regard to "her position in a sanitary point of view," it must be remembered that she is moored close to the shore; and such portion of the filth as is not carried away with the tide must float ashore (if the wind happens to be south), and thereby aggravate disease, particularly in hot and sultry days.

25. I believe not.

26. Damp, close atmosphere, with the winds veering from east to south.

27. Unanswered.

28. The weather was extremely hot through the whole summer, and an unusually heavy fall of rain during the months of September and October.

29. In full and robust habits; with regard to foreigners, I believe, it has paid very little deference to any class of persons.

30. The inhabitants (native) do not appear to have taken it so freely as Europeans; among those of the natives attacked, it appears generally to have been more fatal to children, and chiefly among the white population.

31. See Answer to Question 9.

32. I do not think there is a sufficiency of either to justify such a conclusion, except it be from decomposed vegetable substance in the large marsh in the neighbourhood of Hamilton, and those substances alluded to at Question 17.

33. I do not know any that have been very carefully observed. I would suggest, 1st. A rigid observance of the Quarantine Laws, to effect which the health officer should be amply paid for his services, and be totally unconnected with any other place of profit, save that which immediately relates to his profession. 2d. As the colony cannot afford to do this *in toto*, I think it would be advisable for it to co-operate with the Government, and vest that office in the person whom I shall speak of in my next answer. The garrison colony and convict establishment will, I think, be mutually benefited thereby. Persons in the Government service are likewise accustomed to obey orders, and will obey them unflinchingly. It was performed in 1819 by Dr. Williams, of the army.

34. 1st. The instant dispersal of the troops, or any other body of persons similarly collected. 2dly. That all communication with the patients should be immediately cut off by Europeans. 3dly. The removal of the patient to a floating hospital, which might be kept at a moderate expense, when compared with innumerable occurrences that might otherwise take place, or to some island, and there be nursed by a native; for I conceive it to be a fatal error to permit foreigners to wait on each other among a large body like the garrison or convict establishment. The disorder, particularly if a dispersal of the troops, &c. does not immediately take place, must spread like wildfire, and it is unreasonable at that time to expect to find nurses; the effect then is inevitable. And 4thly. I would recommend that in the medical department there should be a veteran whose judgment and experience can be relied on, one who can give proper effect to his orders, and not be influenced by any in authority over him. I should think that a person of this description might, if he is on the staff or otherwise, easily do the duty of quarantine officer. If in St. George's, he is close to the entrance of the harbour, and can board vessels in any weather; if at the dockyard, he is within a few hundred yards of the channel, and can either bring them to anchor at "Grassy Bay," or send them to "Granaway's Deep." There are, ordinarily speaking, from 1,800 to 2,000 persons in the Government service, all foreigners, to say nothing of the naval squadron on the station; and I do humbly suggest that this recommendation is worthy of consideration. Lastly, on this head I will offer one more recommendation, which is, that the younger medical officers in the medical department, as conveniency may offer, be sent to the more tropical climates to collect information upon the treatment of this horrid disorder; for I think, from their signal failure in the late fever, they must have mistaken the disease, and I am induced to think so, from the fact that one of them openly declared in the public newspaper that it was "not yellow fever;" another in the following "Gazette" said that it was "yellow fever of a mild sort;" but whatever might have been the colour of it, or type, its mortality was fearfully at variance with their assertions, and without a parallel in this climate.

35. The head-quarters of the 56th, which was sent to the Ferry Point, were encamped immediately alongside of the road. I passed them very frequently, and had

Answers of J. H. Trott, Esq.

had an opportunity of making close inquiries, and after a few days had the satisfaction to learn that they ceased to be attacked, and continued healthy so long as they remained in that spot.

There were, unfortunately, a few cases of the sick or convalescents carried to Prospect Hill, to which I attribute the spread of the disease in that neighbourhood.

36. It is, I think, chiefly owing to its geographical position, and the general healthfulness of its climate.

37. I do not know exactly, but it was very small.

38. I cannot urge my suggestions too strongly at 33 and 34. I am strongly impressed with the idea that our Quarantine Laws cannot be too rigidly enforced, more particularly as we are now, by means of steam communication, placed in immediate contact with those islands and settlements in the hotter climates in which the disease so frequently exists; and although it might be proved that yellow fever existed at Boaz Island prior to the arrival of the "Merlin" in June, it does not, consequently, prove that she did not import it also. I cannot reconcile its existence at the western extremity of the island, and then at the eastern extremity, whilst the whole intermediate space is left untouched until the Prospect Hill spread it. If it is to be accounted for by the constant communication, that fact would establish contagion, and hence another reason for the rigid enforcement of Quarantine Laws.

(signed) *J. H. Trott,*
Prov.-Mar. General.

30 January 1854.

No. 42.

Answers of Coroner *Keane*.

Answers of Coroner Keane.

1. I was elected coroner on the 23d March 1848. I have never served in that capacity in any other climate.

2. My experience during the visitation of yellow fever in 1843 was extremely limited, being confined almost altogether to the putting up of prescriptions sent to me, as a chemist, by medical men.

3 to 5. Unanswered.

6. It is my present belief that the disease was not originated here.

7. In no respect different from the opinions I have always entertained.

8. I think it communicable. The case of Mrs. Cooper at Port Royal was a striking illustration. Her son died in her arms of fever at St. George's. She returned to Port Royal, a distance of 15 miles. She was seized with the epidemic, and communicated it to her whole family of children, two of whom, with herself, died. There was not a case in the parish prior to her arrival from St. George's.

9. Unanswered.

10. Not residing in St. George's when it originated, I am not capable of giving a correct statement.

11. to 17. Unanswered.

18. In Hamilton the night-soil is received in deep pits; to the best of my knowledge they are but seldom cleaned out, but the very porous nature of the rock might in some measure obviate the necessity of so doing.

19 to 24. Unanswered.

25. I think not.

26. A close moist atmosphere, a warm temperature, and easterly winds.

27. Unanswered.

28. The temperature was very high; I never saw a more rainy season.

29. Europeans or natives of a northern climate, and also those of a full or plethoric habit.

30. I think the inhabitants are more exempt, particularly the coloured persons.

31. I believe it can be communicated by any of the above.

32. I do not.

33. Cleanliness and temperance.

34. Unanswered.

35. To the best of my belief, the separation of the troops was beneficial.

Answers of Coroner Keane.

36. In my opinion, there are no natural causes.

37. I cannot state with sufficient accuracy the proportion, but among the Europeans the mortality was very much greater.

38. The mortality amongst the troops and convicts having been so much greater than amongst the colonists, might it not be worthy of consideration whether a change in the dietary of the former, somewhat assimilating to that of the latter, could not be made, *i. e.* whether a semi-weekly issue of fresh fish, and a larger proportion of vegetables, on the remainder of the week, might not be productive of benefit?

(signed) *Charles Keane*, Coroner.

No. 43.

Answers of Coroner *Tucker*.

Answers of Coroner Tucker.

1. For seven years and upwards a justice of the peace, and six years coroner, in these islands.

2. I was with several persons labouring under yellow fever in 1819; and in 1843 I attended on four of my children, and a servant, ill of the same disease.

3. On the 17th August 1853.

4. On board the hulk "Thames," where I was called on as coroner to hold an inquest on a convict by the name of "Robert Hall," who died near midnight of the 16th. From the appearance of the body, I was quite of opinion that the man died of yellow fever. Dr. Joseph S. Hunter, the surgeon, in his evidence stated, that "in consequence of some obscurity of the symptoms, I for my own satisfaction had a *post mortem* examination this morning, when the body exhibited the usual appearance of fever. The immediate cause of his death I consider gastric fever."

5. Unanswered.

6. I am of opinion that the origin of the disease was by importation.

7. Previously to the breaking out of the fever in a general form, I had entertained no opinion as to its origin.

8. I do think it communicable. A Mrs. Cooper, who came from Southampton parish (where there had not at that time been a single case of yellow fever) to St. George's, to attend on her son, who died of the late epidemic, was soon after her return to Southampton attacked, and died of the fever; her daughter, who attended on her during her illness, shortly after died of it. In 1819 I was ill of yellow fever in less than 24 hours, after having been in a room for some time with a person dying of the disease. I could mention other cases of a similar nature.

9. By inhaling the breath, and remaining for any length of time in a room with a person labouring under the disease.

10 to 14. Unanswered.

15. I consider the barracks and hospital in St. George's far more eligibly situated than they could possibly have been in any other part of the colony. The salubrious situation of the barracks is generally remarked by strangers visiting these islands. There is no marsh land in St. George's. The barracks, or the houses hired for the purpose, in the town of Hamilton (the land to the north of which is low and very marshy), are in the front street of the town, and almost surrounded with inhabited houses. The barracks at the dockyard, like those in St. George's, are on an eminence.

16. Unanswered.

17. The soil generally in St. George's parish is what is called "Adam," or red soil. The town of St. George is contiguous to, and westward of, the barracks. The corporation occasionally inspect the back yards and lanes of the town. This was done in the month of June 1853 (some time previously to the breaking out of the fever), when everything of an offensive nature was removed. The burial-ground is in the town; scarcely a case of fever, however, occurred in the houses adjacent thereto. There are two slaughter-houses, which are kept very clean. The number of cattle slaughtered is about six per week. The number of pigs kept

Answers of Coroner Tucker.

kept in the town is less than in 1819 and 1843 (owing, I presume, to agriculture being more general than at those periods); there are a few pigstyes in town.

I do not consider that the fever was in the slightest degree engendered or aggravated by the situation and condition of the town of St. George, which has hitherto been afflicted by epidemics far less than other parts of the colony. The harbour of St. George's has three outlets to the ocean, which is peculiar to that harbour alone.

18. The night-soil is thrown into the harbour or privies. Few of the houses have cesspools.

19. As observed in answer to question No. 17, St. George's has been less frequently visited by epidemic diseases than other parts of the colony. The natives have suffered but trifling, in comparison to the adventitious population.

20. Unanswered.

21. The town of St. George's was repeatedly fumigated. A quantity of Government bedding was burnt, which, from all I have heard, aggravated instead of mitigating the disease. The bedding was used, I was informed, by persons who died of the epidemic. The effluvia arising from that burnt near the hulk "Thames" was intolerably offensive.

22. The convicts are, from what I have heard, well fed and attended to. Whenever I have been called upon to hold inquests on board the hulk "Thames," the evidence has shown that the sick have always been cautiously taken care of.

23. Unanswered.

24. I do not know how long the "Thames" hulk had been moored in St. George's Harbour; her position was certainly not a good one in a sanitary point of view, being under a hill, and entirely shut out from the north winds. I have frequently heard it remarked that she would have been better afloat. This remark was made both prior to and after the breaking out of the disease.

25. No.

26. The atmosphere has generally been close. The temperature unusually warm, and the wind east, when yellow fever has spread in Bermuda.

27. During the fever of 1843 the atmosphere, temperature, and winds (which were for the most part east) were very similar to those of 1853.

28. The temperature was higher than usual, but not higher than in 1843. Much more rain, however, fell than isusually the case during the same season.

29. Robust constitution.

30. The inhabitants are more exempt from yellow fever than Europeans. The coloured population seldom suffer from its effects.

31. Refer to Answer to Question No. 8.

32. The fevers of 1819 and 1843 were at that time distinctly ascertained to have been imported; nor have I ever until now heard it argued that yellow fever may be produced in unfavourable states of atmosphere, or from other causes, at Bermuda.

33. Unanswered.

34. The dispersion of the troops and convicts. During the late epidemic, on holding an inquest on board the hulk "Thames," there were over 70 men (as I was informed) lying very close together on the upper deck, all suffering from and in various stages of the disease. For the want of room, there was no separation of the healthy from the sick.

35. In 1843, after the early removal of the troops to Ferry Point, and placing the sick in well-ventilated rooms, the fever abated. The separation of the troops during the late epidemic was not made until very many were affected by it.

36. From the peculiar position of the islands, I presume, being in the middle of the Atlantic, and in a mild latitude.

37. Not more than four or five per cent.

38. In a pamphlet, published at Edinburgh in 1821 by a Bermudian, I find the following, which it may (though perhaps not very material) be as well to record here: "Per æstates annorum 1818 et 1819, febris pestiferæ naturæ, quæque omnia signa ostendebat (quantum colligere potui) febris flavæ, in insulâ Bermudâ accidit. Hæc insula autem puritate aëris semper celebris fuit, quodque desiderabat omnes hos morbos qui in Indiâ Occidentali tantopere semper sævierunt. In pluribus autem partibus ejus paludes sunt satis amplæ, terraque in quam navalis statio constructa est locaque vicina admodum humilia sunt, sæpeque

Answers of Coroner Tucker.

sæpeque mari increscente æstu lavantur. Calor autem per dictas æstates major fuit quam antea unquam cognitus erat. Thermometrum plerumque inter 85° et 90° fuit, sæpeque prope 100°. Febris primum se ostendit eâ insulâ in quâ statio navalis sita est. Sustulit plerosque ex iis qui operibus superfuerunt, quique in iisdem occupati sunt. Ex quatuordecim autem de societate militari, qui nuper ex Angliâ advenerant, duodecim mortui sunt; eâdemque vehementiâ morbus inter milites legionis sexagesimæ secundæ in anno 1818, et legionis quintæ decimæ in 1819 sæviit. In proximâ autem legione etiam plures mortui sunt, ideo fortasse quia altera legio diutius in insulâ fuerat antequam morbus incepit. Perpauci ex indigenis, pro ratâ parte, mortui sunt. Ut autem colligantur alia testimonia potestatis miasmatum ex paludibus ad movendas febres, solum referam ad opera Joannis Pringle, Equitis, Doctorisque Clarke." The title of this pamphlet is "Dissertatio Medica Inauguralis de Febre Flavâ."

With regard to the much-talked-of fever of 1796, the following has been recorded: "Governor Campbell was taken on the 25th November, at noon; he was seized with a kind of shivering, and pain in his back and loins, which terminated in yellow fever. The first unfavourable symptom was a stoppage of urine, as none came into the bladder; that was in some degree removed; but the vitiated state of his stomach, on which nothing would remain, and what is called "black vomit," were the symptoms that left us but little hopes of his recovery. He had three strong convulsive fits, recovered his senses perfectly after the two first, but the third terminated in his death, this afternoon, at half-past three o'clock, 2d December 1796."

27th February 1854. (signed) *J. Brownlow Tucker.*

No. 44.

Answers of *John T. Fisher*, Esq., J. P.

Answers of J. T. Fisher, Esq., J. P.

1. Fifteen years, as justice of the peace and police magistrate of the town of St. George's, in which town I have resided more than 40 years.

2. In the years 1819, 1843, and 1853, I visited and remained at night in a friendly way with some persons who were ill with yellow fever, and saw its effects on those, as also on others at my own residence.

3. The first case of the late epidemic fever that came under my observation was on the 7th September last, in the person of the late Mr. Tapp, of the Ordnance department.

4. Mr. Tapp was clerk at Ordnance Island, where he was employed daily from nine o'clock, a. m., to three o'clock, p. m. His residence was not far from the convict hulk "Thames," on board of which vessel the yellow fever commenced about the middle of the previous month, August; his case ended fatally, and was a well-defined case of black vomit. I was with him all the night previous to his death on the 8th September last. I believe this was the first case in the town excepting the convict guards, and one or two others who attended inquests on board of the "Thames," who no doubt brought it from that vessel into the town. Several persons who attended inquests there in August, died in September following, and of these Mr. Cusack died very near the domicile of Mr. Tapp on the 4th September last. It was difficult to find persons for an inquest there at the latter part of August.

5. Unanswered.

6. I think that the late epidemic fever was imported, and that it was contagious.

7. Unanswered.

8. I am of opinion that it is communicable. Mrs. J. D. Cooper came from the parish of Port Royal here early in September last, and attended her son, who died of black vomit; she afterwards returned to Port Royal, which parish was then understood to be in a healthy state; was taken ill and died about the 17th of the same month; others related to her were also taken ill, some of whom died soon after.

9. By inhaling the breath of a sick person, or remaining long in attendance in a sick chamber, or by frequently handling the garments of fever patients.

10. I have reason to believe that the fever was introduced into this parish by the

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the steamer "Merlin," from St. Thomas, or from the naval yard. A lady passenger died on board of the "Merlin," and was buried in the town on the 25th June 1853, some say of fever, others say not. On the following day that vessel went to the naval yard, and was coaled there by a lot of convicts, returned to St. George's, and left for New York on the 27th June. It is very remarkable that the wife of the pilot, and another at his house, with several others at St. David's Island, opposite the town, where the pilot resided, were the first persons in this parish that were taken down with fever. On the 2d August, about a fortnight before it reached the convict hulk "Thames," one of these (Samuel Fox) died there with black vomit; prior to this date, I learn from good authority that many deaths occurred at the naval yard, and the fever did not reach the "Thames," at St. George's, till about the 16th August, after which it spread among the troops and the inhabitants. The communication from the naval yard and St. David's Island with the "Thames" was constant and unremitted.

11. Unanswered.

12. The troops diet on good fresh and salt meat, bread, and vegetables; they generally occupy the Royal Barracks and forts, all of which are in healthy localities, elevated above other parts of the island.

13. I cannot say, unless that some of the men who may be exposed to the heat of the day in summer would be more sensible than the natives of the occasional sudden changes of the atmosphere at night.

14. Unanswered.

15. It would be difficult, I think, to point out anything in the localization of the troops at St. George's that would affect them unfavourably, after the removal of the "Thames." The beach below Barrack Hill to the south, and the property in rear of the barracks to the north, belongs to Government, and can be kept perfectly clean. I consider that the burning of a large lot of clothes and bedding, which were taken from the "Thames" to said beach, affected the men unfavourably. The localities and general eligibility of the barracks and hospitals, both at St. George's and at Ireland, are very good.

16. *See* No. 1.

17. The soil at the town of St. George's is light and porous; that at the Island of St. David's quite the reverse, being red clay and principally on limestone. St. George's is situated to the westward of the barracks and all the forts except Fort George. The small house, lanes, and back-yards are often examined by order of the corporation, and cleaned out when required; this was done about the commencement of last summer. Some drains lead into the privies, and the whole contents are buried in deep pits; others lead into the harbour. The tides ebb and flow about four feet, and their influence is sufficient with the force of the wind to carry any filth out of the harbour. There are two boat entrances besides the ship channel to the east of the harbour, and not far from the barracks another to the west towards the ferry; consequently, should the wind be either east or west (the latter prevailing most), everything is swept at ebb tide into the ocean.

The burial-ground is in the town, but no doubt will soon be abandoned for a better. There are three slaughter-houses in the town, near the harbour, which are kept clean by the water from thence; about six cattle slaughtered per week; some few pigs are kept in the town, but they will soon be expelled. The population is not very great; and nothing here has ever yet, in my opinion, engendered yellow fever.

18. The night-soil is thrown into privies; some cesspools lead into them, others into the harbour; some few persons neglect cleaning them until their attention is called to it, when the whole contents are buried in deep pits. On this point I must observe, that I never knew of an instance in this town where a privy was found so offensive as those at Fort George and Fort Victoria, probably from the great bulk of the latter.

19. We have had yellow fever here three times during the last 34 years, and I believe it was imported on each occasion. The natives have suffered very little at any time in comparison with its adventitious population.

20. Unanswered.

21. The corporation were diligent in looking through the town to prevent the accumulation of everything likely to aggravate the disease. The troops were removed to the Ferry Point, but unfortunately not until after many of the convicts

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victs had fallen, and the military hospital crowded with over 100 patients. The men were placed under canvas at the Ferry on or about the 13th September last, and must have suffered during the high winds and heavy rains. The tents in use were a miserable substitute for barracks.

22. The convicts diet on good fresh and salt meat, bread, and vegetables, and have sufficient exercise to keep them in health.

23. Unanswered.

24. I think the "Thames" had been moored in St. George's harbour, under Barrack Hill, about seven years; cannot be positive; her position, directly under a hill, was not a good one in a sanitary point of view but not likely, in my opinion, to generate disease. This ship has since been removed, and is now moored in the centre of the harbour.

25. I should say not.

26. A damp atmosphere, hot temperature, and long-continued easterly winds, are most favourable to the spread of yellow fever in Bermuda.

27. Merely from recollection. In the year of 1819 it was very hot and sultry. In 1843 long easterly winds, with frequent rains. In 1853 much more so.

28. The temperature was not higher in 1853, but we had more rain than usual.

29. Stout, and apparently healthy persons.

30. The inhabitants are generally more exempt from yellow fever than Europeans; children, both white and coloured, excepted.

31. Answered at No. 1.

32. I do not think that yellow fever may be produced in Bermuda under such circumstances; but no doubt, when once introduced or imported, unfavourable states of the atmosphere would aggravate the disease. We have very little vegetable or animal substances so exposed.

33. I would subject all vessels with disease on board, or from an infected port, to quarantine for a short time at least; if steamers arrive under such circumstances, and want coal, let them have it under proper regulations, but prevent the immediate landing of the crew and passengers to mingle with the inhabitants, and smoke the labourers, pilot, and every article from the vessel.

34. On the appearance of fever among the people again, I would recommend that the military be removed without delay to the Ferry Point, the Naval Tanks, or other convenient place; but instead of canvas tents, I would construct a light comfortable covering of corrugated galvanized iron; low sheds from 15 to 20 feet in length might be constructed of this material in England, and sent out to be deposited at the Ordnance department here for use when required; after being so used, the whole may be returned to Ordnance Island, there to remain until again wanted, and in the end the expense would be less, I think, than that of canvas tents, which are always rotting, and of little use in exposed situations in a rainy season. *See* 38.

35. The separation of the force from St. George's to the Ferry did not result in checking the disease so soon as we had hoped, and the subsequent remove from there to Prospect Hill, after the men were comparatively in a healthy state, was more injurious, I learn, than otherwise. The men were not, I think, removed in time; and the tents were unfit for the occasion.

36. Because the islands are situated in a mild latitude, having nearly all through them pure fresh breezes from the ocean.

37. The mortality amongst the natives, compared with that amongst Europeans, I should say was about four per cent.

38. I would employ coloured men and women to attend the sick, and prevent by every possible means the healthy soldier from visiting the sick. I would see that the contractor for washing barrack sheets and bedding had an abundance of rain-water at command, or sufficient tanks, and that the whole should be cleansed at his establishment for washing beyond the limits of the town. The coloured women have been in the habit of receiving each a portion of these articles from the contractor, which they have washed in the town, but from their scanty means, and short supply of water, it was impossible for them to

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give satisfaction on all occasions, while at the same time such a distribution of articles from a diseased hospital, and sickly men, no doubt assisted the spread of the late epidemic through this town.

St. George's, Bermuda, (signed) *John T. Fisher*, J. P.
17 March 1854.

Sir, St. George's, 15 April 1854.

YOUR letter of the 12th reached me on the evening of the 13th instant, and on the morning of the 14th (yesterday) I sent a constable to St. David's Island, to notify Israel Burcher to attend the Commissioners at Hamilton, as you requested. Burcher has promised to attend accordingly, on Monday next.

I would beg leave to observe, that I still hold to the belief expressed in my answer to the 10th question of the printed regulations, forwarded to the Commissioners on the 18th ultimo; that I visited St. David's Island, in company with others, in November last, and after viewing all the statements noted at that time on the subject of the late epidemic, I came to the conclusion that we had sufficient ground for believing that the fever was either introduced into this parish by the steamer from St. Thomas or from the naval yard; and that I arrived at this without much consideration as to anything the pilot, Burcher, advanced; for he said very little to me, and I was under the impression that he had some scruples, fearing perhaps that as so much had been said about the "Merlin," and the fever, that he may be pulled up for an offence against the Quarantine Act, having conducted this vessel into port.

I would add, that I have lately understood, from Seth Harvey, Esq., barrister here, that he heard Burcher, the pilot, say that the lady who died on board of the steamer was as yellow as gold, and that he touched her.

You will oblige me by appending this letter to my answers on the printed questions.

I have, &c.
Lieutenant-colonel S. Oakeley, (signed) *John T. Fisher.*
H. M. 56th Regiment.

No. 45.

ANSWERS of *Joseph Stewart Hunter*, Esq., M.D., Health Officer and Surgeon, "Thames" Hulk.

Answers of J. S. Hunter, Esq., M.D.

1. THIRTY-TWO years; 12 in the army, and 20 in the convict service.

2. I have had the opportunity of treating the yellow fever in Bermuda in the year 1819, 1843, and 1853.

3. On the 26th August.

4. On board the convict hulk "Thames;" the case was one of remittent fever, and terminated fatally, unattended with black vomit.

5. I was surgeon of the convict hulk "Thames," where all the officers and greater part of the prisoners were attacked with the epidemic.

6. So conflicting are the opinions of professional men on this subject, that I feel reluctant in hazarding an opinion; I must, however, state that I am in favour of importation.

7. This was ever my opinion.

8. I am of opinion the fever may be communicated, not by contact, but by inhalation, more particularly *in articulo mortis.*

9. Answered in No. 8.

10. I am of opinion that the fever was imported; and for particulars relating to this query, beg to refer the Commissioners of inquiry to the answers given by the Board of Health and Vestry of St. George's.

11. I am of opinion that specific miasma may, under special circumstances, produce yellow fever.

12 to 16. Unanswered.

17. The soil of St. George's is of two distinct qualities; one part composed of a stiff reddish clay, having a limestone bottom; the other and greater portion light and sandy, particularly porous, admitting immediate absorption of the heaviest fall of rain.

The town of St. George's is situated to the south and west of the barracks, the forts being some distance removed from either; the drainage principally into the harbour. The lanes and back-yards are frequently inspected by the Board of Health, for

Answers of J. S. Hunter, Esq., M.D.

for the purpose of having them kept clean. Provision has of late been made by the parish, which cannot fail of improving the sanitary condition of the town. The extent and influence of the tides are highly beneficial, having a fall of four or five feet, with outlets to eastward, south, and west. The situation of the burying-ground is decidedly bad, being placed in the middle of the town. There are two slaughter-houses in the town, near the water, and both kept particularly clean. There are a few pigstyes in St. George's, a nuisance about to be removed.

18. The night-soil is generally thrown into the harbour, or buried in pits in the yards or gardens in St. George's.

19 to 21. Unanswered.

22. The dietary of the convicts is good, consisting of a fair proportion of animal and vegetable food. The space allotted to each man on board the "Thames" is from 190 to 200 cubic feet. The sick convicts are treated in the convict hospital hulk.

23. The convict hulks, with the exception of the "Thames," appear to be judiciously placed. This ship, since October 1844, was placed on a bank in the eastern extremity of St. George's Harbour, 15 or 20 feet from the shore, at the bottom of a steep hill, where ventilation was most imperfect; and being surrounded by masses of vegetable and animal matter in a state of decomposition, might, in my opinion, generate disease.

25. Bermuda is not subject to endemic fever.

26. Calm weather, close heavy atmosphere, with but little rain; east or south-easterly winds.

27. I believe there was but little variation in the state of the atmosphere during the epidemics of 1819, 1843, and 1853. Heavy rains in the latter.

28. Answered in 27.

29. Persons of full habit, labouring under chronic visceral disease, and others subjects of intemperance, were most predisposed to its attacks.

30. The inhabitants of the colony, more particularly the coloured population, are more exempt from attacks of epidemic fever than Europeans or other strangers.

31. I do not think it can be communicated by direct contact with persons suffering from it, or with the bodies of those who have died of it; but I do think it may be conveyed by persons in health wearing articles of dress of the deceased, or by inhalation more particularly.

32. I am of opinion that it may.

33. Cleanliness, temperance, free ventilation, careful avoidance of crowded apartments, particularly among the lowly, and immediate change of locality, if practicable.

34. Answered in 33.

35. I am perfectly cognizant of the fact.

36. In consequence of its salubrious climate, its central position in the Atlantic, and the total use of tank water.

37. The mortality amongst the natives, compared with that of Europeans, is about four per cent.

38. I must decline answering this question.

(signed) *Joseph Stewart Hunter*, M. D.,
Health Officer, and Surgeon "Thames" Hulk.

Sir,

St. George's, 29 March 1854.

I HAVE the honour to acknowledge the receipt of your letter of yesterday, having reference to the arrival in this port of the steamers "Blasco-de-Garay" and "Merlin," and in reply, very much regret to state, that being absent from town when the former, and confined to bed by indisposition when the latter vessel arrived, I am unable to put the Commissioners in possession of the information they require from personal knowledge of the facts.

Dr. Frederick Hunter, who acted on both occasions as my deputy, states that on boarding the "Blasco-de-Garay," he put the questions prescribed by the Quarantine Act to the captain and surgeon on oath, through the principal engineer, being the only person on board who could speak English; that they both stated there had not been any death or sickness on board during the voyage, with the exception of a few cases of venereal disease.

Dr.

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Answers of J. S. Hunter, Esq., M.D.

Dr. Frederick Hunter visited the "Merlin" in June last, when he was informed by the captain that a death had taken place on board, and referred him to Staff-surgeon Austin for particulars of deceased's death. Dr. Austin assured Dr. F. Hunter that the lady had not died of yellow, but from the debilitating effects of intermittent fever.

On this occasion the answers were not received on oath. There were various reports in circulation at this period of clothes and bedding having been destroyed on board the steamer, but I could never trace it to any authentic source.

With many apologies for my great remissness in not having sooner replied to the original letter,

I have, &c.
(signed) *J. Stewart Hunter*, M.D.,
Health Officer.

Lieut.-colonel Oakeley,
Chairman Commission of Inquiry,
&c. &c. &c.

LETTER of *Frederick A. S. Hunter*, Esq.

Sir,
St. George's, 3 April 1854.

I HAVE to acknowledge the receipt of your letter of yesterday, requesting information relative to the death of a lady on board the "Merlin" in June last. In reply, I beg to state that I inspected the body of the deceased, and from the statement of Staff-surgeon Austin, who was a passenger on board, and my own personal observation, am of opinion that she died from the debilitating effects of intermittent fever, arising most probably from a diseased state of the liver, as in most cases of chronic hepatic affections there was a yellow tinge of the skin. It was reported on shore that a quantity of clothes and bedding had been thrown overboard. I am not aware of these reports having been traced to any authentic source.

I have, &c.
(signed) *Frederick A. S. Hunter.*

Lieutenant-colonel Oakeley,
56th Regiment.

No. 46.

ANSWERS of Dr. *A. J. Harvey.*

Answers of Dr. A. J. Harvey.

1. OCCASIONALLY doing duty for the troops quartered in and near the town of Hamilton, in the absence of the military surgeon. In all, about 15 months.

2. I have experienced three visitations of yellow fever during the 24 years I have been in practice in Bermuda.

3. On the 24th August I was called to the boy Thompson, furtively brought from the "Thames" hulk, St. George's, to his parents in Hamilton, labouring under fever.

4. On board the hulk "Thames," St. George's, where he was staying with a brother, an officer of that ship. It was doubtless a case of the epidemic, though it only showed symptoms of common continued fever, and terminated favourably in about five days, without black vomit.

5. My time was entirely engrossed by practice during the prevalence of the disease, being the oldest practitioner in the town or parish.

6. I believe it to have been imported; and it was the fever known as the bilious, remittent, yellow, or Balam fever.

7. The first few cases I saw having no malignant characters, I considered it only a common continued fever.

8. I do think it communicable. One striking instance was that of a woman going from a healthy and remote parish to see a dying son in St. George's, returned in a few days, died herself of fever, and several of her family suffered the same fate, though the latter did not leave their home. Other similar instances are known.

9. It appeared to require no peculiar circumstances to make it so, except in degree; this characteristic being more evident in towns and crowded or populous places.

10. Being health officer, I was called on, late in October 1837, to visit Her Majesty's ship "Seringapatam," from the West Indies, to recruit her crew, convalescing from yellow fever. Considering the advanced period of the season, cool weather setting in, I was induced to give her pratique. In a few days, a number of persons at Ireland Island, in the vicinity where the vessel was landing her stores, were attacked with malignant fever; and as the islands had been previously perfectly healthy, no doubt could be entertained that the "Seringapatam" introduced the disease. We had no more fever until 1843, in which year the West India steamer began to run from Havannah, touching in six days at Bermuda, having almost always cases of yellow fever on board. Again, we have fever

Answers of Dr. A. J. Harvey.

fever in 1853, originating in St. George's, the port where the steamer "Merlin" runs in monthly, in four days, from St. Thomas's, the hotbed of fever for some time past. Now, as I know of no evidence bearing on its native origin, I am inclined to believe that this fever is a foreign importation.

11. I have no grounds for forming any opinion on Question 11.

12 to 15. Unanswered.

16. I have been resident at Hamilton about 24 years.

17. Unanswered.

18. In Hamilton, pits are dug at such depth that they are rarely or never cleaned out; no unpleasant odour or apparent inconvenience resulting therefrom.

19 and 20. Unanswered.

21. An universal lime-washing of the houses was insisted on, and the drains, &c. were cleaned out in Hamilton previous to the disease reaching there. Two men of a company of the 56th, under my medical charge, being attacked with fever, the company was immediately removed to Oxford, about two miles distant. No subsequent case, I believe, occurred in this company.

22 to 24. Unanswered.

25. None, to my knowledge.

26. Moisture, high temperature, and easterly winds appeared to further its progress.

27. None.

28. The amount of rain was unusually great, and continues to the present time, January 1854.

29. Plethoric habits, and persons who are not natives, or rather persons from northern latitudes.

30. The natives are immeasurably more exempt than foreigners. No difference in sexes or ages. Coloured people more exempt than white.

31. I have no means of deciding to which of these conditions it owes its power of being communicated from person to person.

32. No such instances have come under my own observation, but I should think it not improbable that during the hot season such causes may develop this disease.

33. Separation, cleanliness, and all other such well-known sanitary measures.

34. *See* Answer 33.

35. In 1843, dispersion was followed by an immediate subsidence of the disease. In 1853 this effect was not so marked, as far as my observation went.

36. I ascribe this circumstance to the non-existence of any inherent powers of production. The marshes are clearly innocuous; persons living in the midst of them enjoying such excellent health as to give rise to the impression that they are the most salubrious portions of the island, and that it requires a chain of favourable events, not of common occurrence, to admit of its importation.

37. At a rough estimate, I should think that not over three per cent. of deaths were natives.

38. Unanswered.

(signed) *A. J. Harvey*, M.D.

Sir, Hamilton, 11 February 1854.

In reply to your letter of 7th instant, relative to a dead body having been landed from the brig "Charles," of Newfoundland, and the captain of that vessel being allowed to come on shore, I have the honour to forward the following particulars. On 10th October 1853 I visited this vessel officially, and was informed by Captain Taylor that he was 15 days from Demerara; that his wife (a passenger) died the night before, and that he had come in with the view of having the body buried in consecrated ground. He stated that the deceased had been long in ill health;* that she had gone out to the West Indies, hoping for an improvement, but continued declining till her death.

I at once told him that it was impracticable to bring the body on shore, but offered him an island for its interment. He peremptorily declined this arrangement, and said he would prefer taking the body away with him in spirits. On my return from the vessel I ordered a spirit-tight coffin†, and sent it on board. A careful examination of the officers and crew showed

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* Mr. William Perrot, jun., knew the parties in Demerara, and states that Mrs. Taylor was ill all the time there, and Mr. E. Harvey knew them previously to their leaving Newfoundland, and states she was then believed to be in consumption.

† Made by Mr. Jackson of this town.

Answers of Dr. A. J. Harvey.

showed them to be in apparent good health; the dead body exhibited no indications of death being occasioned by malignant disease, and my only reason for refusing was to prevent popular excitement. The next day, to my surprise, I received an intimation that a vault in Paget churchyard, and every accommodation for the burial of his wife, had been offered the captain. This at once removing the only reasonable obstacle to his wishes, I felt it would be imprudent in me to withhold my consent, and accordingly the deceased was borne and followed to the grave by a number of parishioners.

The same circumstances, viz., the absence of any reasonable grounds of suspecting infectious disease on board, induced the executive, at my suggestion, to permit that captain to transact some necessary business with his agents on shore, it being clearly the duty of the health officer to make the Quarantine Law as little oppressive as possible to the distressed mariner, as to protect the community of which he is the guardian. Besides, the captain having suffered from yellow fever some years previously in the West Indies, we had high authority for granting this permission.

" Vessels under Quarantine: The Yellow Fever.—The Lords of Her Majesty's Privy Council have ordered, that when any vessel, at any port or place in the United Kingdom, shall be placed under quarantine on account of yellow fever, all passengers on board of such vessel who shall make a declaration that they have had an attack of that disease at some former period, and shall satisfy the officers of health visiting such vessel that the fever from which they have suffered was the yellow fever, shall thereupon be permitted to land, notwithstanding that such vessel is placed under quarantine on account of that disease."—*Lancet.*

Now, in conclusion, I would wish particularly to call the attention of the Commissioners to the fact, that so far as yellow fever is concerned, no quarantine whatever was necessary; for by a reference to dates it will be found that this disease was at its zenith throughout these islands at this period, viz., 10th of October; and in fact, as already observed, restrictions were only imposed to allay popular alarm; an object, however, most wantonly frustrated by certain persons, to whom the principles of common humanity which prompted the above measures of relief are entirely unknown.

I have, &c.
(signed) *A. J. Harvey*, M. D.,
Health Officer.

To Major Oakeley, 56th Regiment,
&c. &c. &c.

Sir,
Hamilton, 3 March 1854.

In reply to the several inquiries respecting the brig " Charles," in your letter of the 27th February, I beg to state, firstly, that I personally inspected the body of the deceased wife of the captain; secondly, that I did not administer an oath to the captain; thirdly, that I have no memorandum of the date of the death of the second mate, who died of symptoms of yellow fever; but I think he was taken ill about a week after his arrival, and expired in about three days. Another was slightly indisposed, but exhibited no marked symptoms, and was under no medical treatment. Fourthly, from inquiries that I made on hearing the rumour of the " Charles" having lost one of her crew previously, I had reason to believe that such was the fact, although the captain denied that any one had been ill besides his wife.

I take this opportunity of reminding the Commissioners, that my first case of yellow fever in Hamilton occurred on the 27th August, in the son of Mr. Thomson (tailor), who was brought from the " Thames" hulk, in St. George's. From this time it spread in the practice of other medical men as well as my own; three fatal cases occurring in the company of the 56th previously to their removal from the town on the 29th September. I would also call their notice to a perfect nidus of yellow fever, inhabited by Portuguese next the Presbyterian Church (in the vicinity of Findletter's), from which José Oliviera Mentz was buried on the 3d October. The Prospect hospital, within 20 minutes walk of this town, was established on the 28th September.

Now, as the " Charles" did not arrive until the 10th October, was then anchored at the quarantine station, at least two miles away, and the only person admitted from her to Hamilton being a perfectly healthy one, the captain, it appears to me illogical (to say the least of it) to infer that she could have exercised any influence over the late epidemic here.

I have, &c.
(signed) *A. J. Harvey*, M. D.

To Major Oakeley, 56th Regiment,
&c. &c. &c.

No. 47.

Answers of Dr. *T. W. Hunt.*

Answers of Dr. T. W. Hunt.

1. Unanswered.

2. During a practice of 20 years, the only epidemic fever I have seen was the fever of 1843, which prevailed in a mild form to a considerable extent in this part of the country.

3. The first case which came under my observation, and which I am sure was the

Answers of Dr. T. W. Hunt.

the first that occurred in the parish, I was called to on the 14th day of September 1853.

4. It occurred in a man of colour, who drove a pair of horses to St. George's on the night of the 9th September 1853, and returned to Somerset on the following day (Saturday). I was called to this man on Wednesday, the 14th, and found him labouring under nearly all the symptoms of the epidemic of 1843; he had been ill two days when I first saw him; the case was well defined; the pains in the head and back were intense, and he bitterly complained of the latter; he recovered after about five days' illness; but before he left his bed, his wife and all of his children, in number seven, were attacked with the same symptoms, but in a milder form than the father. That this individual contracted in St. George's the fever under which he and his family suffered cannot reasonably be doubted; his exposure nearly all night on the box of a carriage probably rendered him more susceptible of the infectious principle. The house in which he resides stands on the borders of the sea; the grounds about it are low and swampy on the east, and exposed to the drainage of high hills on the western side; the interior of the building was low, filthy, and confined, especially the bedroom, circumstances which occasioned me to predict the spreading of the disease through the family.

5. The late distemper was by no means serious or general in this part of the country; the number of cases did not exceed 20, and these, with two exceptions (fatal), were of a mild type. These two exceptions were both affected with black vomit; the one was a native, a boy seven years old; the other was a man, late a private in the 42d regiment; he had been about a fortnight in the parish, having previously been much about Hamilton.

6. With regard to the origin of the fever, I ascribe it to a local cause, in the absence of any good proof to the contrary. The disease seems to have commenced in a mild form, a circumstance which tended to mislead the medical officers. I had two cases of common continued fever under my care in August last, and there were, I believe, several other cases about the country. Such a fever in crowded, ill-ventilated apartments or localities, where, amid much heat and moisture, decomposition of animal and vegetable matter has been allowed to accumulate, may assume a very malignant character as its victims multiply. The air of a neighbourhood thus circumstanced may, from these superadded causes, beget a pestilence; the infection extending to nearly all who breathe it, but becoming less remarkable as the distance from the focus of infection increases. Hence, says one of our most eminent medical writers, "in large, crowded, or populous cities, particularly in seasons when the temperature is high, and the air humid, and is already contaminated by exhalations from animal exuviæ and burying-places, the infectious emanations from persons first attacked heighten the exciting aërial contamination, produce a more marked effect, and more readily spread the malady in these places than in those differently circumstanced." The above observations apply with awful force to our late condition. The town of St. George's, where I believe the late fever originated, furnishes all the sources for the development of pestilential disease, under such conditions of the atmosphere as prevailed during last autumn; the low site of the town; its close crowded habitations, with a churchyard in the midst; its neglected pigstyes and privies, and other nuisances common to all towns, in favourable conditions of the atmosphere, are admirably calculated to call the infectious germ into existence, or to give it wings if introduced from abroad.

The above remarks apply in some degree to the town of Hamilton and other localities throughout the colony.

7 to 10. Unanswered.

11. The preceding remarks will show that I am of opinion that yellow fever may be thus generated, but it is well known that not a few of our most eminent physicians and writers stoutly contend, that before this distemper can be brought into existence, the poisonous germ must be introduced.

12. Unanswered.

13. The man who is exposed to the night air in hot countries is, I apprehend, more liable to fevers of every kind than others who are less exposed. Soldiers on guard at night, exposed to the chills and dews incident to warm climates, may come under this head.

14. Unanswered.

Appendix.

Answers of Dr. T. W. Hunt.

I have already stated that the first case which occurred in this parish, was in a man who had gone to St. George's, and returned on the following day, was seized with the fever which was communicated to his family. I will now relate another striking instance in proof of its communicability.

A woman, A., who lives at the extreme point of Somerset Island, went to St. George's in October, (I am unable to give the exact date), to attend on her son, ill of the fever, he being at that time servant of an officer, who himself fell a victim to the disease. Her son recovered, and the woman returned to Somerset on Saturday; there was not at this time a single case of fever in the neighbourhood, nor as far as I know in the parish. On the Monday following she was seized with fever, and before she could resume her employment, three other persons of colour, a woman, B., and two children, who lived in the same house, but in different apartments, were also seized with the disease. In the neighbourhood of their house there are several habitations densely crowded with a coloured population; and about a furlong distant, reside a family of white persons. Three children of this family suffered from the disease; the first attacked died of the black vomit before he obtained medical assistance. The coloured persons, A. and B., were in the habit of visiting this house, and I have been able to trace with unerring certainty, that the woman B., who was acting in the capacity of laundress in this family, was there attacked, by her own confession to me, with the pains so peculiar to yellow fever, and to such a degree, that she was obliged to hurry home to bed. Now, although the time between the first symptoms of fever in this woman, and the attack of the first white child, was more than two and less than three weeks, yet there is nothing in the history of other well-known infectious diseases, to make us doubt the possibility, nay, probability, that these children took the infection from the coloured family, and that these latter had previously received it from the woman A., who had been at St. George's; and I think so for the following reasons: First, because the two houses just enumerated, and the one mentioned under section 4th, were the only houses in this end of the island that could be said to be infected. Secondly, they were situated on the extreme western shore, in the vicinity of other dwellings inhabited by a dense coloured population, and yet the latter all escaped. Thirdly, the complete immunity of the European residents, in number about 20, who were not in a single instance affected, and who, if any aërial contamination or epidemic influence had extended to this part of the country, would have been among the first victims. Now, although I believe that the yellow fever is generally of local origin, and very rarely (if ever) imported, I see nothing in its nature or history to prevent this contingency. If, as I have shown, that this disease can be transported through individuals from St. George's to Somerset, a distance of 20 miles, there can be no difficulty in believing it can be thus carried 50 miles; and if 50, why not 500 miles?

Let us suppose a vessel sails from an infected port, and during the voyage a fever breaks out among the crew; on her arrival, the captain, knowing he will be placed under quarantine, brings his invalids on deck, who remain there during the visit of the health officer, who of course thinks it unnecessary to examine the crew individually. After his departure, the man is quietly put in a boat and sent on shore; or if the patient is too weak to stand the deck, he may be secretly landed before the vessel gets into port. Let us further suppose this infected individual is taken to some obscure hovel, to elude discovery, in a pent-up overcrowded part of the town, where he finds an atmosphere already reeky with foul emanations, it is surely no stretch of fancy to say that this fresh importation would be as a match to the mine; and from this cause a foul and infectious distemper disseminated among a people who, but for this, may have wallowed harmless in their native filth. It is much the fashion of the present day to decry quarantine regulations, but, situated as our island is, in the middle of the Atlantic, and subject to visitations of vessels from all quarters of the globe, I am strongly impressed with the conviction that while we should spare no pains to prevent the recurrence of domestic pestilence, so, in these days of rapid communication, we should be earnestly solicitous to crush its invasion from a foreign source by a steady and rigid administration of the Quarantine Laws.

25.* I consider the fever of 1853 to have been endemic, and not epidemic.

* So in copy.

26. The long prevalence of east winds, a humid atmosphere from 75° to 80° succeeding the hot summer months, are most favourable, in my opinion, to the

Answers of Dr. T. W. Hunt.

the propagation of yellow fever, just such states of the atmosphere as prevailed to an unprecedented extent in the autumn of 1853.

27. I have no reliable means of comparing these conditions, having kept no record of the weather. I have often had occasion to remark that the hot dry summers are the healthiest.

28. I am unable to say anything of the temperature, but I am quite sure that more rain fell during the autumn of 1853 than had fallen during the same season for a great number of years, not, it will be observed, during, but after the hottest weather, that is to say after August and September.

29. Constitutions enfeebled. The poor and persons in humble life seem more predisposed to fevers generally; but this does not obtain in yellow fever among Europeans (except those long enured to the climate), who are stricken down without respect to persons.

30. Europeans in every tropical climate are undoubtedly more liable to yellow fever in a severe form than natives; but in this parish, where there are not fewer than 20 Europeans resident, not a single case of fever occurred among them; a circumstance that can only be explained by the hypothesis that the epidemic influence did not extend to this end of the island; for nearly all the persons affected with fever in this parish received it, as I have already shown, from two individuals who had been to St. George's, and who themselves were taken with the fever shortly afterwards, and communicated it to others in the same houses, such houses being in every way adapted for rendering the disease infectious.

31. I have no personal knowledge that yellow fever can be communicated by either of these modes; but the European, or persons predisposed, who may come in direct contact with the dying and the dead, or who smell or handle articles of dress or bedding used by either, would in my opinion encounter additional risk of taking the disease; and if we are to credit some authors, there can be no doubt of the fact.

32. I have already answered this question, under Section 10, in the affirmative.

33. The practice of letting tenements to an indiscriminate number of persons is fraught with evil. The crowded state of these among the coloured population in many places is lamentable, and the consequences must be reckoned among the predisposing, aiding, and determining causes of disease. In the towns especially, more ventilation is required, the first step to health. The houses are rarely or never whitewashed "inside," a duty which devolves upon the tenant, and not the proprietor; hence its neglect.

"The burying of the dead," says a distinguished medical writer, "within, under, and around chapels and churches, or in large burying grounds situated within, or close to cities or towns, is among the most serious evils of the present state of society, and of existing legislation." The above-mentioned nuisances call loudly for remedial measures, and must arrest the attention of corporate bodies and the legislature.

34. With respect to what measures should be recommended to prevent the spread of fever in case of its recurrence, I would refer the Board to the observations of Sir William Pym, and to the excellent suggestions of Sir David Barry, published in 1831. One remark of his I will make, which ought never to be forgotten: "The perfect inutility, nay, absolute mischievious tendency of cleansing drains and privies, after the pestilence has commenced, with a view of arresting its propagation."

36 and 37. Unanswered.

38. I would suggest, with much deference, that there be a local Board of Health, with ample powers to carry into effect whatever sanitary reform may be found necessary; that officers be appointed to act under the orders of the Board, whose duty it shall be to have the dwellings of the poor and humble cleansed and whitewashed once a month during the hot and rainy seasons; that lime and other disinfecting agents be supplied at the public expense; that the officers have power to cut doorways and windows, and to enlarge others where further ventilation is necessary for the future promotion of cleanliness. Tanks should be built in different parts of the town, and in country places, where "wells" are not found, for the use of the poor and destitute, who frequently, in warm seasons, during great droughts, suffer much personal inconvenience for the want of a due supply of water. Among persons thus circumstanced, it must be expected that all infectious diseases will prevail extensively; and such diseases will, under

Answers of Dr. T. W. Hunt.

peculiar states of the atmosphere, spread to the abodes of all classes of the community.

I have already adverted to the over-crowded condition of many of our tenements, an evil I fear more easily pointed out than remedied. That a certain class of our population "has increased, and is increasing," and cannot be diminished is, I would almost say, a lamentable fact. Their aggregating propensities, and dogged pertinacity in sticking to the home of their childhood, and the common sources of disorder incident to their condition, together with the moral degradation they induce, favour the development and spread of disease, and will be found among the most formidable impediments to sanitary improvement.

(signed) *T. W. Hunt.*

No. 48.

Answers of Surgeon *Gray*.

Answers of Surgeon Gray.

1. I entered the service as assistant surgeon in the Royal Navy in January 1813, served on the North American and West Indian station, until the latter part of the summer of 1818, when I was appointed to the Royal Naval Hospital, Ireland Island, Bermuda, in which situation I remained until 1834.

2. When I joined the hospital in 1818, the yellow fever was raging in it, at the dockyard, and throughout the islands generally; it affected both natives and Europeans with the same virulence: it continued to rage until near Christmas, and broke out anew, and quite as fatally, in 1819, as during the former year. I had the whole charge of the dockyard, as acting surgeon, in addition to my own duty as assistant at the hospital.

3. On the 27th August 1853, a case came under my knowledge and attendance at St. David's Island.

4. A boy in a house within 50 yards of the one in which my patient lived had died some days before, with all the worst symptoms of yellow fever, as reported to me, but I did not see him.

The mother of my patient visited the child in the neighbouring house, and witnessed his having the black vomit; her child, a boy of 13 years, complained in the morning of the 27th August of lassitude and weariness; about four o'clock in the afternoon headache, pains in the back, and violent fever came on; he had slight irritability of the stomach, and strong determination of blood to the head. The worst symptoms soon yielded to the remedies applied, and on the fourth day the fever left him, very weak, and his intellect quite clear.

5. My residence being in Somerset, which parish was most mercifully spared the visitation (except in a few instances), only one case has fallen under my observation here, viz., a coloured woman. Hers was a more violent attack than the one at St. David's. She had visited a relative who lived in a house infected with the prevailing epidemic, and two days after was attacked with the usual symptoms in an aggravated form; on the third day pain in the stomach and retching came on; had it not instantly been met by the remedies my long experience enabled me to use in this the most dangerous premonitory symptom, I feel confident it would have been black vomit in a short time. Her situation for days after was so critical as to require constant watching. She did well, and is now as strong and healthy as usual.

6. From all I can learn of its appearance in St. George's, I am inclined to think that the infection was imported, that the heavy rains and continual dampness of the air during the whole summer caused the rapid progress of the infection, the disease becoming more malignant as the mortality increased.

7. My opinion was from the first the same as I have now expressed.

8. Decidedly communicable. My whole experience during my long course of practice in this disease renders me certain on this point in general, and the two cases I had during the prevalence of the epidemic of 1853 were proofs positive.

9. Close rooms, impure smells, foul beds, linen, &c., and too close approximation to the sick.

10. I am of opinion that this fever was imported, because in all my long residence here I have never known yellow fever prevail, except when it could easily

Answers of Surgeon Gray.

easily be proved to have been imported. How it has been so in the present instance I cannot say, except a very short visit to St. David's Island in the month of August, I have no personal knowledge of the circumstances under which it first became known to the public.

11 to 18. Unanswered.

19. In 1843 the yellow fever prevailed through the islands; it was very fatal to Europeans in St. George's, and slightly so to both natives and strangers in every parish. I had in that year a very extensive practice in Sandy's and Southampton. My patients were numerous, but the fever yielded easily to the remedies employed, so that I never lost a patient.

20 to 24. Unanswered.

25. In my opinion, no.

26. Heavy rains and dews, with hot suns, all of which have prevailed to an almost unprecedented extent during the last summer.

27. Unanswered.

28. Much more rain fell. I have no means of judging as to the temperature.

29. Persons of robust habits.

30. Natives are generally more exempt, males and females suffer equally, children not so much in general; but during the past visitation a greater number of them have died than in any other I have known. Coloured persons not so numerously or so violently affected as are white.

31. Yes, to all the questions.

32. No.

33. Stringent quarantine regulations with regard to all vessels arriving from infected ports or places, and the prevention of all communication with the shore from such vessels until sufficient time has elapsed to render such communication safe.

34. Unanswered.

35. It would appear that the removal of the several detachments of the forces contributed greatly to check the disease in garrisons, and that those who were sent to different localities, in which the fever had not appeared, escaped it; I am of opinion, therefore, that such separation was most beneficial.

36. First, because it is not natural to the climate; and, secondly, because I think there is something in this climate which resists the disease, except when (like the last summer) it is uncommonly wet and hot, and so prepared to take any infection which may be accidentally introduced.

37 and 38. Unanswered.

(signed) *Thos. Gray*, R. N.

No. 49.

ANSWERS of *Park B. Tucker*, Esq., M.D., Warwick Parish.

Answers of P. B. Tucker, Esq., M. D.

1. WITH reference to this question, I am a private practioner, but have been twice employed in Her Majesty's service; first during the epidemic of 1843, one month, and during the late epidemic, 1853; in both instances at St. George's.

2. The only epidemic in which I have had any experience in Bermuda was that of 1843. It was not near as malignant as the late one, the term "bilious remittent fever" more properly applying to that epidemic, as it was of the same type as I have met with in the colony of Berbice, British Guiana, where I was in practice for the period of three years. That fever is endemic to that colony.

3. The first case that came under my observation was on the 14th September, in the person of Mrs. Cooper, of the parish of Southampton.

4. At St. George's, where this person had been to wait on her son, who died there of black vomit; the case ended fatally of black vomit. This case was treated by Dr. Reese, of Hamilton.

5. I was called on the 14th September to render my services at St. George's as assistant to Dr. Innes, of the 56th Regiment, his two assistants being ill of the fever, and I was employed 26 days; after which my practice was confined principally to natives, 19 in number, only one of which proved fatal, although one of the

Appendix.

Answers of P. B. Tucker, Esq., M.D.

the native patients had genuine black vomit, and the only case to recover that has ever come under my practice; it was Miss Cooper, aged 15, of Port Royal, daughter of the Mrs. Cooper referred to in No. 3.

6. I was in the first instance inclined to attribute its origin to local causes existing in St. George's, such as an over-crowded graveyard in the centre of the town; very confined streets, and several dilapidated buildings, receptacles of filth liable to engender putrescent vapours; as also cesspools, which I believe are very seldom cleansed; and the fact of the front street having of late been built up, shutting out the south winds of summer, which are considered healthy. But, notwithstanding what I have enumerated as causes for generating fever, there has been invariably these conflicting circumstances to contend with; viz. vessels arriving in the island with yellow fever on board, or passengers landing suffering from it previous to its showing itself; and, lastly, cases that have occurred in isolated and healthy districts have been quite as malignant as those I saw at St. George's.

7. The foregoing answer applies to this question in a general form.

8. I think it is communicable under peculiar circumstances; witness the case of Mrs. Cooper (Answer No. 2), in which every branch of the family (five in number) took the fever after the mother's return with the disease. Previous to this the parish was free of fever.

9. By inhaling the exhalations of persons suffering from fever, or by means of bedding or clothing tainted with the disease.

10. I am of opinion that yellow fever can be imported, from the fact of its having been introduced at Boa Vista, one of the Cape de Verd islands, by Her Majesty's ship "Eclair," in 1845. "Previous to her arrival the place was healthy, but after her departure great numbers of the inhabitants were attacked, and it proved very fatal."—*Bascome's History of Epidemic Pestilences*, p. 174.

11. I decidedly think so, *vide* Bascome's History, p. 247, where he states the poisonous effects of the exhalations from a graveyard in Minchinhampton, England, by the removal of a quantity of earth, and all who inhaled the vapour arising from it took a peculiar fever, which proved very fatal in this previously healthy locality.

12 to 17. Unanswered.

18. By means of cesspools. I have already spoken as to the cleansing out of the cesspools in Answer No. 6.

19 & 20. Unanswered.

21. With reference to this question, I beg leave to refer to Dr. Innes's letter, published in the "Royal Gazette" of the 6th September 1853, which were the first precautionary measures that I am aware of; and secondly, the distribution of the troops to various parts of the island.

22 to 24. Unanswered.

25. Not in my opinion.

26. Close atmospere and moist weather with easterly winds are most favourable to the spread of yellow fever in this climate.

27. I have no means of comparing the conditions contained in this question.

28. The temperature was nearly the same as the previous year, varying from 79 to 84; much more rain fell than is usual during the same season.

29. Robust constitutions and natives of northern climates, particularly Europeans.

30. Decidedly so. During the late epidemic, in my practice, there has been no difference between the native white adults male and female, but children of both sexes have suffered severely; coloured persons have been nearly exempt, as is generally the case in yellow fever.

31. I think so in both instances, which I have already asserted in No. 9.

32. I am of opinion that yellow fever may be produced from local causes now in existence; but remove them, and the island would be healthy. I do not think it indigineous to the climate.

33. Cleanliness and ventilation, and the strictest attention to quarantine regulations, together with the avoiding of concentrating large bodies of men, particularly Europeans. I am also of opinion that floating hospitals are not adapted to this climate.

34. The immediate dispersal of all large bodies of men.

35. The fever of 1843 disappeared in a very short time after the removal of the troops to the Ferry Point.

36. The

Answers of P. B. Tucker, Esq., M. D.

36. The general salubrity of the air, together with its geographical position, both tend to that result.

37. As far as I have been able to ascertain from various sources, the proportion of mortality amongst the natives compared with Europeans, is about four per centum.

38. I have no further suggestions to offer, which appear to me material.

(signed) *Park B. Tucker*, M. D.

Warwick Parish, 16 January 1854.

No. 50.

Answers of Dr. *Henry J. Hinson.*

Answers of Dr. H. J. Hinson.

1. Unanswered.

2. I witnessed the epidemic of 1843. The spring and summer of that year was remarkable for the high temperature and the great quantity of rain that fell. The first case of fever that I saw was in the month of May; it occurred at my father's residence, in the person of one of my brothers, and was of the "bilious remittent" type. Several similar cases had occurred in the family previous to my arrival in Bermuda. Subsequently, in the course of the summer and autumn, I saw a number of cases, principally in Hamilton parish. Nearly all these cases occurred in the neighbourhood of marshy lands, or the small inlets of the sea, where vegetation is rank and rapid, and where the ground is flooded by the tides, such as Shelly Bay, Walsingham, or about the small ponds near the residence of A. S. Trott. It was not until the autumn that the cases I saw began to assume the form of yellow fever. In several instances I saw both forms of fever, in the same family, at the same time.

3. The first case that occurred in my practice was on the 12th August.

4. At the Salt Kettle, in the person of a stranger, who had been resident in Bermuda about six months. The principal part of his time previous to his having fever was spent at the school, situated on the glebe in Warwick parish. At other times he was in the habit of visiting families about the parish of Warwick, and occasionally the city of Hamilton. As far as he knows he never was exposed to contagion. The case was mild and terminated favourably. The subsequent yellowness of skin first awakened the suspicion in my mind that the case was one of yellow fever.

5. Unanswered.

6. That the fever was of local origin, and was only an aggravated form of the remittent fever common to Bermuda, aggravated by local and atmospheric causes.

7. I have entertained the same opinion ever since I witnessed the epidemic in 1843.

8. I do not. That yellow fever may occur without exposure to contagion I have had satisfactory proof in my own person, and that of my family. In October 1849, both myself and family suffered from attacks of yellow fever, without, to my certain knowledge, our being exposed to any contagion whatever, as I had not then seen any case of fever for several months, or indeed for the whole summer previously. I was attacked on the road, and on arriving home found Mrs. Hinson also labouring under fever. My daughter was attacked two days after. In her the fever exhibited the same insidious train of symptoms as I saw in some of the fatal cases last year. She had the vomiting of brown matter that usually ushers in black vomit, and her life was despaired of. Two other practitioners, Dr. Hinson, sen. and Dr. Smith, were of the same opinion. Subsequently I saw several other cases of yellow fever. Again, none of the cases I witnessed either in 1843 or 1853 could I trace to previous exposure: but I saw many cases, which as far as the patients knew themselves, occurred without their coming in contact with any one labouring under fever, or with the clothes or effects of any person. I subjoin two instances, as where two families were exposed to the so called contagion in 1853 without taking the disease. Mr. Thomson, tailor, in Hamilton, had two relations resident in St. George's. They came to Hamilton, when the epidemic was at its height in St. George's, and were attacked with fever. They were attended by himself and Mrs. Thomson, neither of whom

suffered from fever afterwards. Mr. Falconer, schoolmaster, spent a day in St. George's; on returning to Hamilton was attacked with fever, and died at his residence at Mr. Thomas Smith's. He was attended by Mr. Smith's family. No cases occurred in that family subsequently.

9. In my opinion, under no circumstance whatever.

10. Unanswered.

11. I am of opinion that they can.

12. Unanswered.

13. The circumstance of his being a native of a cold climate, his frequently being exposed to the deleterious influence of the night air, and his intemperate habits.

14 to 16. Unanswered.

17. There are three descriptions of soils in the Bermudas. That in the valleys on a level with the sea is composed almost entirely of peat, or fine pure vegetable matter, in union with tannic acid, which, preventing its undergoing decomposition, renders it inert. Around the margins of these marshes, however, where the peat comes in contact with the calcareous soil washed down from the hills, it is in a state of rapid decomposition. These valleys are the most extensive in the islands; they range east and west, are covered with a dense mass of bushes, and are in some places influenced by the tides. The second description of soil, found in the more elevated valleys and hollows, consists principally of clay, in union with a large proportion of vegetable mould, some silex, and iron; nearly pure clay is also found around many of the margins of the bays and inlets of the sea, extending some distance under the water. This soil is of a red colour. The third description of soil is of different shades, varying from black to white, according to the amount of its vegetable impregnation. It is calcareous in its composition, consisting of the disintegrated material of which the underlying rock is composed, mixed with some vegetable mould, the remains of the decomposed cedar-roots and leaves, the mosses, &c., and forms a thin layer on the tops and sides of the hills. The underlying rock, forming as it were the skeleton of the group, is calcareous, consisting of finely-broken coral and shell-sand, agglutinated into thin laminæ. It is a part of the great geological strata forming the bed of the Atlantic, upheaved by some convulsion of nature, thus forming the numerous islands and rocks which compose the Bermudas.

18 to 24. Unanswered.

25. Yes. Bilious remittent.

26. I consider a high temperature and rainy season as absolutely essential to the conversion of the usual endemical fever of Bermuda into yellow fever, and its spreading as an epidemic. When a high temperature with much rain, continuing for a great length of time, and especially when accompanied with winds varying from the north-east to the south-east, prevail; in fact, when our climate approximates to that of the West Indies, then the usual endemic, becoming aggravated, attacks a greater number of individuals, appearing under a continuous, a severe or mild remitting form, according as it operates on the robust excitable constitution of the Northerner, or the more acclimated resident or native. This was the case in 1843, and also in 1853.

27. The above conditions were present in 1843 and 1853.

28. The temperature was much higher. At my residence, where the usual range of the thermometer in ordinary seasons is about 86, during the summer and autumn it ranged as high as 91. The fall of rain also was very much greater.

29. The natives of northern climates, especially the young and robust.

30. They are. Generally in epidemic seasons, when Northerners suffer from the severe form and continuous type of yellow fever, the native whites, with a few exceptions, have the bilious remittent form of fever, while the blacks suffer from such slight attacks of fever as scarcely to require any treatment. In my practice the mortality during the late epidemic was confined, amongst natives, entirely to children. This I attribute to their having previously suffered from a severe form of hooping-cough. I am unable to say whether women enjoy a greater immunity than men from fever.

31. I do not think it can be communicated either by contact with the dead or the living body, or by articles of bedding or dress.

32. I am decidedly of opinion that the disease is the effect of emanations from decayed animal and vegetable substances, but more especially from the latter. The

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Answers of Dr. H. J. Hinsen.

The great quantities of decaying and putrid substances accumulated in the small bays or inlets of the sea, with which Bermuda abounds, in the mangrove thickets, and around the margin of the marshes, more particularly where the soil consists of red clay, and is flooded by the sea, are ample sources for the production of those poisonous miasms which, in particular states of temperature and moisture, tend to produce yellow fever in warm climates, without our being obliged to look abroad for its origin in contagion. The sallow haggard look, the rapid decay of the teeth, and the hebetude both of mind and body so common to inhabitants of these proverbially healthy islands, are the effects of continual exposure to malarious emanations. If our marshes, instead of being composed of inert peaty matter, were in a state of active decomposition, Bermuda would be uninhabitable.

33. I know of no means that would have the effect of altogether preventing the recurrence of yellow fever. If our marshes were drained, raised, and cultivated, and the numerous deposits of putrid animal and vegetable substances were used up as manure, such measures would go far towards modifying the disease; but notwithstanding such sanitary means, as the disease is dependent in some degree on causes beyond the control of men, Bermuda will always, as hitherto, be subject to periodical epidemic visitations, under particular states of the atmosphere, and at these times the weight of the mortality will fall on the unacclimated stranger. Such has been the experience of the past. Yellow fever epidemics can be traced as far back as 1740.

34. When epidemics occur, the best measures would be removal from the district in which they first appear to such places as we know from past experience are most healthy; and such places we should expect to find in the most elevated parts of the island, at the greatest distance from the marshy land, and where the soil is dry and sandy. The hills around the signal post at Port Royal would form one of the most eligible situations for an encampment in case of an epidemic, as the residents along that range of hills are said to enjoy an almost total exemption from febrile attacks. When they are suffering, in lower situations, avoidance of exposure to the night air, shanties, or temporary wooden buildings, would afford greater protection than tents against the deleterious effects of the night air. The latter, from their not keeping out the rain, would be apt to generate dysentery. Temperance, if possible, and the daily use of moderate doses of quinine, might be beneficial.

35. Separation, both in a moral and physical point of view, would be of service in arresting the spread. No doubt many cases could be cited of persons taking the disease owing to the depression under which they laboured at seeing so many of their comrades carried off, placing them in a more fit condition for yielding to the malarious influence, who would otherwise have escaped; and although crowding and filth cannot generate contagion, they certainly will have the effect of producing the means of generating malaria.

36. I cannot assign any reason for its spreading so seldom as an epidemic here. Since 1843 I have been in the habit of seeing sporadic cases during the summer and autumn, and at these times the temperature has been more elevated, and a greater quantity of rain has fallen than is usual to these seasons, though not to the extent that it did last year. Bilious remittent is a form of fever endemical to Bermuda. Indeed, it is the only form of idiopathic fever I have ever seen here, in the course of 10 years' practice. I regard yellow fever as only an aggravated form of that fever, they being but types of the same disease. It is easy to conceive, that under particular states of the atmosphere, the usual type may become aggravated, and converted into yellow fever. Why that condition should obtain so seldom, or ever at all, is more than I can say. This I do know, that after an unusual elevation of temperature, and fall of rain, fever becomes more general than in ordinary seasons; early in the season assuming the form of mild remittent, which as the season advances assumes the form of severe remittent among natives, with some exceptions, and yellow fever among strangers, again assuming the mild remittent form as the season advances and the weather becomes cool. In October 1849, as before mentioned, a number of cases of fever, either aggravated, remittent, or yellow fever, occurred among the natives; and it is singular, that although it spread among them to such an extent as to be entitled to be called an epidemic, it did not extend its attack to strangers. It would be interesting and important to the present inquiry to

Answers of Dr. H. J. Hinson.

ascertain the sanitary condition of the 42d Regiment, then stationed in the islands.

37. In my practice the proportion of mortality was one native to four strangers.

38. In addition to the recommendation in answer to Question 34, I think that in future more barracks should be erected in Bermuda. They should be built on elevated situations, and especially where the soil is dry and sandy; all the clay soil both under and for a considerable distance around them, being removed. The system of covering clay soil with broken rock and sand, as is frequently practised here in levelling, forming a wet retentive subsoil, loaded with vegetable matter in a state of active decomposition, is more productive of foul emanations than we are aware of, which in a hot and wet season must be fertile sources of fever, to those who are living over and near them. They should also have basements well open to ventilation, the floors being elevated at least six feet above the ground.

(signed) *Henry J. Hinson*, M. D.

No. 51.

Answers of Dr. *T. L. Godet.*

Answers of Dr. T. L. Godet.

1. I have never been in her Majesty's service, but I have been in Europe, viz. in England, Scotland, France, Italy, Switzerland, Germany, and Holland; also in North America and the West Indies.

2. My former experience has been rather extensive.

3. The first case of the late fever came under my personal observation on the 16th October.

4. That case originated in a house in Reid-street, opposite to the barracks at Hamilton, in the person of a discharged soldier of the 42d Regiment. That individual had been labouring under fever four days before I was called in to see him; I was informed that the patient had been drinking very freely of brandy previous to his illness. This was a well-defined case of black vomit, and it ended fatally.

5. The nature of my practice was chiefly among the native white and colored persons, and the extent was chiefly confined to the town of Hamilton during the late fever, 1853.

6. My present opinion is, that it was generated by a combination of endemic causes, some of these causes were noxious gases from the earth. The nature of that malady was of a very malignant kind of fever.

7. My opinion is the same as that which I entertained before the breaking out of this fever in a general form.

8. I do not think that is more than occasionally communicable, I have known many instances where the attendants on the sick have caught the fever, and on the other hand where they have escaped the disease.

9. In my opinion it may become communicable to individuals under circumstances of great mental depression and anxiety of mind, accompanied with emanations from the bodies of the sick.

10. My opinion is, that it was not imported.

11. Yes, that is my opinion.

12. As I have never had the medical charge of the troops, I cannot satisfactorily answer that question.

13. I think not.

14. I cannot give a satisfactory answer to these particulars.

15. I am not sufficiently informed on the subject.

16. I have been residing only in the town of Hamilton these seven years past, in the capacity of a practitioner of physic. The whole period of the year 1853 I was at Hamilton.

17. I am not at present sufficiently informed on these particulars.

18. The night soil in the towns of St. George's and Hamilton is thrown into the cesspools, the cesspools are usually detached from the houses, and are never cleaned out, speaking generally.

19. I do not know.

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Answers of Dr. T. L. Godet.

20. That is a question I cannot answer.

21. I do not know.

22. I am not acquainted with the management of the convict establishment.

23. I am not sufficiently informed on these particulars.

24. I have not very recently visited St. George's, and I cannot give a satisfactory answer to that question.

25. Yes, but rarely the typhus fever.

26. Moist atmosphere, high temperature, southerly and easterly winds are most favourable to the spread of yellow fever at Bermuda.

27. No, I have not.

28. Yes, the temperature was higher in 1853, and there fell less rain during the hot weather than is usually the case during the same season.

29. Robust constitutions occasionally become its subjects, and ultimately its victims; but in a large proportion of cases, the ravages of fever are exerted in those in whom debility has been brought on by accidental causes, such as an impoverished diet, long-continued bodily fatigue, close confinement, irregular habits, late hours, &c. &c.

30. Yes, the inhabitants of the colony are generally more exempt from yellow fever than Europeans. The white and coloured children, both male and female, are more predisposed to yellow fever than adults.

31. No, not by direct contact with the person suffering from it, or with the dead body of one who died of it; but it may occasionally be communicated by direct contact with articles of dress, or bedding used by either.

32. Yes, I do think that yellow fever may be produced in unfavourble states of the atmosphere at Bermuda by emanations, both from decayed vegetable and animal substances.

33. The best means of prevention have been found in not sleeping or remaining all night in unhealthy situations, also in avoiding unwholesome diet, long watching, fatigue, or severe evacuations, &c. &c. &c.

I would suggest that ventilation and whitewashing should be strictly attended to.

34. Removal to a healthy district, and a free use of disinfecting agents.

35. The mortality was considerably less.

36. Because of the naturally healthy climate of Bermuda, the mean temperature of which is between that of the West Indies and British North America, partaking neither of the extreme heat of the one, nor the excessive cold of the other.

37. I do not know.

38. I would further suggest that in all dwelling-houses recourse should be had to the free use of chemical substances, which have the power of decomposing contagious effluvia. Of these the principal are acid vapours, particularly those of the nitric and ascetic acids and chlorine. Strict attention should be observed towards adhering to the antiphlogistic regimen, especially by Europeans during the prevalence of yellow fever in Bermuda.

No. 52.

Answers of Dr. *W. B. Peniston.*

Answers of Dr. W. B. Peniston.

1. Unanswered.

2. The late fever is the first epidemic I have witnessed since I have been in practice.

3. September 16, 1853.

4. It originated on the north side of Pembroke parish, in a house near the water. The case was a coloured woman; she was taken suddenly with severe pains in head, back, and neck, and had been vomiting before I reached her, and also had partial retention of urine; she recovered.

5. I have had 34 cases, five of which were Northerners, the remainder were natives, viz.: 4 white men, 4 white women, 2 white children, 5 black men, 9 black women, 10 black children. They all recovered, with the exception of three, who are still under treatment.

6 to 38. Unanswered.

(Unsigned)

Appendix.

No. 53.

Letter from Rev. Dr. Murray to Colonel Oakeley.

LETTER from Rev. Dr. *Murray* to Colonel *Oakeley*.

My dear Colonel, St. David's Island, 13 April 1854.

IN replying to your note, requesting such information as I am able to furnish relative to the illness of the boy Benjamin Samuel Fox, and the parcel of clothing belonging to John Fox, his brother, I think it may contribute to perspicuity if I take the latter subject first.

1. John Fox left St. George's Harbour in the capacity of seaman on board the American brig "Kolian," Captain Jordan, on the 20th November 1852, being then about 19 years of age. About the 28th April 1853 a letter was received in Bermuda, from one Alcanzor Fox, stating that the writer had met Captain Jordan in New York, and had learned from him, upon inquiry, that John Fox had died at sea, on board the "Kolian," on a voyage between the port of St. Juan and New Orleans, two days after leaving the former place, of "Chagres fever," and that his effects were to be forwarded to Bermuda, to his friends, by either the "Swan" or the "Princess Royal." This seems to be all that has ever been heard of the death of John Fox.

The brig "Princess Royal" arrived in St. George's on Thursday, the 5th May 1853. By this vessel were forwarded a bag, containing a pea-coat and two suits of every-day clothing that have been used and soiled, and a box or trunk containing other wearing apparel belonging to the John Fox whose death is thus reported.

On Friday, the 6th May, two boys, George Jennings (coloured) and Joseph Fox (the brother of John) went on board the "Princess Royal," to receive these effects for the parents. It is said that the bag was opened by them, and the contents turned out and over in the hold of the "Princess Royal." George Jennings has not been in any degree sick since; Joseph Fox has been indisposed, and may have had a slight attack of the epidemic, but it was after the fever had spread very generally. No sickness bearing analogy to the yellow fever appeared on board the "Princess Royal," in which, in her next voyage, Colonel Eden and his family proceeded to New York.

When brought on shore, both bag and box were conveyed to an uninhabited house near the seashore, where they were placed in an empty and well-ventilated upper room. After the lapse of ten days they were brought to an open place on the margin of the sea, where they were opened and the contents carefully fumigated. These articles of apparel were removed to a tank at a distance from any inhabited house, and washed; they remained for two days spread out to dry in the open air, they were then replaced in the trunk, which was nailed up, and continued unopened till the month of October. Neither the woman who washed these clothes, nor her husband, nor either of her two children (boys, of the age of 4½ and 2½ years respectively) has had any attack of sickness, or of other illness.

The boy, Benjamin Samuel Fox, who died on the 2d August, resided at a considerable distance from the localities where these transactions took place, and never was in contact with, nor in sight of, any of the effects of his departed brother.

2. The boy, Benjamin Samuel Fox, died, as I have said, on the 2d of August, at the age of nine years, and was ill only from the Friday preceding. He was attended by Dr. Frederick Hunter, who having never witnessed a case of yellow fever (though he has resided several years and practised as a physician in St. George's), did not recognise the character of his disease, but attributed the symptoms to other supposed causes. Others, however, who saw the child, and who were acquainted through their previous experience with the disease (among whom I may mention was my own wife), had no doubt whatever that his was a well-defined case of black vomit.

3. I attribute the attack of the epidemic on this child to his frequent intercourse with another boy, Millet, of about 14 years of age, who suffered severely from it a short time before, but eventually recovered. Millet's was the first case of a white patient on this island; Fox's was the first death.

I was

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Letter from Rev. Dr. Murray to Colonel Oakeley.

I was inclined to believe, from what I heard, at first, that Millet may have received the infection through a Mr. Anthony Hayward, in St. George's, but I have recently ascertained that such was probably not the fact. There is, however, no doubt that a fever of the epidemic type prevailed in the family of Joseph Birchall on this island antecedently to Millet's being taken. This Joseph Birchall lives about three-eighths of a mile to the eastward of Millet's home; and Millet's mother resides a few hundred yards to the eastward of Birchall's. In passing between his usual residence and his mother's house, the boy must go within a very few yards of Birchall's door, where four patients passed through the fever and recovered. The four referred to were all partially coloured.

4. In reply to your note of the 11th, I beg to say that I cannot ascertain that any child died at St. David's on or even near the 27th August. There were no interments took place here previously to the 22d September. I have searched the register of burials in St. George's, as well as made diligent inquiries throughout the island, and there is nothing approximates the date you specify more nearly than these two:

Samuel Brangman, aged 37, died on the 18th September of fever, but it was then very general.

Martha Minors, an infant in arms, died on the 13th and was buried on the 14th July, it is believed, of fever, but I did not see her. Between her parents' house and that of Israel Birchall, the pilot (who conducted the "Merlin" on the 26th June to Ireland Island, and in whose family the epidemic first showed itself here), there was very frequent intercourse.

I will not detain this to add anything farther, but shall be happy to aid your inquiries by obtaining any farther information you may desire.

I am, &c.
(signed) *J. G. Murray.*

Lieutenant-colonel Oakeley,
Commanding 56th Regt., Hamilton.

No. 54.

Oral Examination of *Isaac Beck Cooper*, Constable of Southampton Parish, taken the 7th day of February 1854, before the Commissioners.

Oral Examination of I. B. Cooper.

Is a native of Bermuda; aged 52 years; all his family (except his wife, who was born in another parish in Bermuda) were natives of that parish. Before the fever broke out last year my family was 10 in number: myself, wife, and eight children; the oldest child was 17½ years; that was my son (Charles Frederick Cooper), who died of the fever in St. George's; he had been living in St. George's about 18 months: used to come home once in two or three months for a day or two. He lived at Mr. Thomas Richardson's, near the Main Guard in St. George's, about 15 months; came home to me for about a fortnight; then got a place with Mr. M'Callan, and lived with him, keeping his store near the Market-square, not quite three months; he never came up to the country while living with Mr. M'Callan. He died in St. George's, on the 9th of September, of the prevailing fever. He had been ill about nine days before he died. About four days before he died we received a telegraphic message that he had had the fever, but was getting better. I went to St. George's that very day; arrived there about 8 p.m.; found my son in bed, at Mr. M'Callan's house, near the wharf. When I saw him I knew he had the yellow fever; his eyes were yellow. Dr. Hunter, junior, who was attending him, told me he was better; but I thought him very weak. He was a healthy lad; had never been abroad from Bermuda. At that time there was no other person in Mr. M'Callan's house with the fever, that I heard of. He told me he hoped to be better soon. I returned home next day; the day after that, came a second telegraphic message, that my son was very ill, and was expected to die. Then (that day) I and Mrs. Cooper went to St. George's; reached there about 10 or 11 a.m.; Mrs. Cooper was about 38 years old; she was a native of Bermuda (her maiden name was Newbold). We both stopped with my son until he died, which was two days afterwards. I found him much worse than I left him. He had his senses. At times he would talk foolish. He had pain at times. I thought it was from stoppage of water; because when he seemed to be relieved, I looked under the bedclothes, and found he had passed water; that part of the bedclothes quite yellow; his linen about the arms and breast

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Oral Examination of I. B. Cooper.

breast not yellow. Mrs. Cooper was in the room with him nearly all the time, but went in and out to her chamber occasionally. None of my family had had yellow fever before. They tell me I did have it when I was a boy, but I have no recollection of it. It was the yellow fever; my mother told me so. My son had every attention. Mr. M'Callan was very kind to him. M'Callan is a married man. My son could not have been treated better. My son had the black vomit profusely towards the last; about seven or eight hours before he died. My son was buried in the churchyard at St. George's. He gradually sunk after the black vomit; a little bleeding from the mouth, but very little. He died between two and three p.m. He was buried that day in St. George's churchyard. We came home next day. None of his clothes or bedding were brought from St. George's. I and my wife carried no change of clothing to St. George's. We went off in such confusion, that we carried nothing with us. I was in the room with my son during the night; almost constantly in and out. The room he was in was up-stairs, facing the harbour. The doctors ordered the windows to be kept open, and there was a strong breeze blowing right through. My son died on Friday, the 9th September. We came up the next day, Saturday 10th, in Mr. Hayward's large boat, wind ahead; came out by the forts, and beat round; we went down in a carriage, driven by Will Bassett. Mrs. Cooper was taken, I think, the fourth day after we returned. I don't think she was away from our house at all before she was taken. She was taken in the night, about midnight. I put my hand on her face. I thought she had fever. I got up directly. Dr. Parke Tucker attended her once only, but had to go to St. George's. He did not say positively what was the matter with her. Our youngest child was not then weaned; still nursing; about a year old. I sent for Dr. Rees. He attended her, I think, the second day. Her youngest child never nursed after my wife came up from St. George's. That young child did not take the fever. My oldest daughter would not let her nurse the child. That child was a girl. Stayed in same room with her mother. Slept in a cradle near the bed; continued there after the mother had the fever, but did not take it. My wife died on the 17th September, in the morning. She never threw up any black vomit; but a few minutes after she died I could see the black vomit in her mouth. Her eyes were not yellow; not like my son. Soon after she was taken she grew very weak; she was of a very weak frame. She had her senses all the time. Did not appear to suffer so much as my son; strong fever. We had no coloured servants. None of the neighbours came to our assistance; they were afraid to come. Our eldest daughter Marianna (aged 16), and myself, attended her constantly all through her illness. My wife's younger sister, Mrs. Ruth Young, came to see her once about two days before she died. Her eldest sister, Mrs. Burns, living near us, came a day or two after my wife was taken, and stopped there till she died. Mrs. Young had a family herself, and was afraid to stop; only stopped about 10 minutes. I have no doubt my wife had the fever, but I do have my doubts whether Mrs. Burns had the fever. About a week after Mrs. Burns left, she was taken sick; but I have my doubts whether it was the fever. I saw her while she was sick; she was an elderly woman, about 60 years old; her rest was broken attending on my wife; and after keeping her bed a fortnight or three weeks she recovered; she seemed alarmed; she broke out over the skin with sores. Mrs. Young lived with her daughter, who was married to Mr. Moore, who had some appointment, and lived at one of the buildings attached to the naval hospital at Ireland Island. Mrs. Young died. Mr. Moore died, and one of Mrs. Young's younger children died. I don't think Mrs. Young took her illness at my house, but at Ireland Island. She was taken ill after Mr. Moore died. I think she took the fever at Ireland.

About three weeks after Mrs. Cooper died, when I thought the house clear of fever, my son Isaac, about eight years old, was taken with the fever. After my wife died, I took every precaution; had the house cleansed and whitewashed; put spirits of turpentine in the whitewash. Isaac had a very strong fever; I got up in the night; put him in a warm bath; he sweated so profusely that the perspiration went through the bed. He got well, but was very weak for several weeks. He had been in his mother's room while she was ill; hard matter (where a parcel of children) to keep them out. His sister Elizabeth was attending on him, and had been attending on his mother; she was taken very soon after her brother; they were both down together, in different chambers: hers was decided fever; black vomit in her mouth; did not throw it up. She was attacked

Ora Examination of I. B. Cooper.

attacked about 4th October, and died 12th October. Her case much like her mother's. She was a very strong healthy girl; she was the strongest-made of the family. Dr. Rees attended her.

Another of my sons, Thomas, aged six years, had a fever; but I do not think it was the yellow fever. He took some medicine from the doctor, but soon recovered.

The last of the family who had it was my eldest daughter, Marianna. I thought we were clear of it; it was upwards of three weeks after my second daughter's death before she was taken. Hers was a decided case of fever; black vomit; she kept up her spirits so well; did not lose her strength; spoke to the doctor. Dr. Parke Tucker attended her; she always looked in the basin; and when she first saw the black vomit, she said to me, "Father, you need not do any more for me." Black vomit, black as your coat, both ways; it passed through her. After she saw the black vomit, she thought she could never recover, but was very composed; told an old woman then where to look for her burying clothes. She took quinine in pills, and she recovered; she could not keep it in liquid. She threw up black vomit, I suppose, a dozen times; also threw up fresh blood out of her mouth. I felt very uneasy about the blood; told the doctor; he said he did not mind that. I do not think Dr. Tucker ever gave her any calomel at all. When she fell sick, I gave her lime-water and salt, to check it; the black stuff passed through her then, and she began to mend. She was nearly 16. She is quite recovered; does not look very healthy in face; looks pale. All of my family had the fever except one boy at sea, and the two youngest children, aged about four years and one year. I lost two children and my wife. There was no communication of any person in the neighbourhood with my house, none at all; no clothes and bedding.

Before Mrs. Cooper had the fever, I heard of no fever at all anywhere in the neighbourhood. The first case I heard of in that parish afterwards was a coloured boy, the grandson of old Anthony Darrell; that boy died; but some say he had got a fall or hurt. I was told he came up from St. George's, sick. I believe Dr. Parke Tucker attended him. This boy never had any communication with my house, and lived three-quarters of a mile from us. He died some weeks after my eldest daughter had it; I think he must have been sick for a fortnight; I heard them frequently ask how he was; and at last they said he was dead. Mr. William P. Darrell lost a daughter in Christmas week. After Mrs. Cooper took the fever, our children were not sent from home, none of them, until after my eldest daughter was taken; then the baby was sent to Mrs. M'Kinney's, as there was nobody at my house to manage it; but the baby never had the fever, nor did any anybody have it about Mrs. M'Kinney's.

When Mrs. Cooper came home from St. George's, my family consisted of myself and wife, and six children, about the house. House contained seven rooms; three bedrooms. I do not think any one else took it from our house, except Mrs. Burns, if she did have it.

My family before this was always very hearty; never lost a child; had eight; brought them all up; seldom called in a doctor.

No. 55.

Oral Examination of *Edward Hilditch*, Inspector of the Royal Naval Hospital at Ireland Island, taken the 1st day of April 1854, before the Commissioners.

Oral Examination of E. Hilditch.

Remembers the arrival of the French frigate "Armide," at Bermuda, from Martinique and Guadaloupe, on the 24th August 1852, with malignant yellow fever. She anchored at Murray's anchorage, and all persons on board labouring under fever, 42 in number, were removed to the temporary hospital on Port's Island, about the 27th of August, and the ship left Bermuda on the 1st or 2d of September; 42 beds with bedding were issued from the Naval Hospital for the sick at Port's Island from the "Armide," and were used by them as long as they remained there; 11 died, and were buried at Port's Island; the rest re-embarked in the "Armide" on the 31st of August; they were removed from the "Armide" to Port's Island in the "Olive Branch," towed by the dock-yard steamer, and the survivors were taken to the "Armide" in the same mode

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Oral Examination of E. Hilditch.

(Dr. William Tucker joined the "Armide" at St. George's; he had nothing to do with the sick from her until they went on board). After the people from the "Armide" had left Port's Island, all the beds used by them were kept out of doors there for 14 days, freely exposed to the air on the grass, and were completely saturated by the rain. The bedclothes and beds were then removed to the wash-house on Port's Island, and washed by three coloured people living on Port's Island; none of whom took the fever; the beds and bedding were afterwards removed from Port's Island to the Naval Hospital at Ireland Island (under the immediate superintendence of my steward, Mr. Moore, who did not take any fever there, but was very susceptible of it (as was proved by his taking the fever and dying of it at an early period of the epidemic of 1853). On removal of the beds to Ireland Island, the hair was taken out of the beds, passed through a solution of chloride of zinc, then boiled in the coppers, dried and repicked, and remade into beds, which since then have remained at the hospital and been in daily use in turn; but no case of fever originated in the hospital, until after the epidemic was brought into the hospital by fever patients from elsewhere.

The articles of clothing used by the sick from the "Armide" were returned into store after being washed; but none of the stores lent to the sick of the "Armide" have since been re-issued for the Naval Hospital.)

I am decidedly of opinion that the epidemic which prevailed here in 1853 can in no manner be ascribed to the arrival of the "Armide," or be supposed to have originated in any way connected with the "Armide," nor could it have been produced by any fomites derived from the "Armide."

No. 56.

Oral Examination of Assistant-Surgeon *William Deeble*, 56th Regiment; taken the 3d April 1854, before the Commissioners.

Oral Examination of Assist.-Surgeon William Deeble

I WAS quartered at St. George's in June last, when the "Merlin" (steamer) arrived there from St. Thomas. I was sitting with Dr. M'Kenzie, who was ill at the time, at Mrs. Edwards' boarding-house, in St. George's, when two gentlemen came in who were passengers by the steamer, and commenced conversation. The bell commenced tolling, and they said they should be off to the funeral. I inquired who it was, and was told it was the wife of some American sea captain, who had died on board the steamer, who was going to New York for the benefit of her health: had been confined in childbed about three weeks before, and had not recovered when she was put on board. Something was said about the child coming ashore in clothes too large for it. I think the child was brought to Mrs. Edwards', and remained here for some time, and was sent on to America in some other vessel. The funeral took place about three or four o'clock. I have no reason whatever to ascribe the outbreak of the fever in Bermuda in 1853 to the landing of that body, or in any way to the visit of the "Merlin," or her passengers. At that time there was no case of yellow fever existing in Bermuda to my knowledge. The first case which came under my knowledge was that of Mrs. Davis, the wife of Private Davis, 56th Regiment, mentioned in my answer to the printed question, No. 4, which occurred on the 15th of August 1853. I had seen her the day before sitting at her door at Paget Island, apparently well; she had been confined in childbirth about a month before, and seemed to have recovered. On Monday, the 15th, I was called to attend her, and continued to attend her till her death. The case terminated fatally, at one o'clock on the Saturday morning, with yellow fever, although not attended with black vomit, which is not an invariable symptom of the disease. I have heard a rumour that some bundle of clothing which had been used by the lady passenger in the "Merlin," who died, as above referred to, had been picked up by Mrs. Davis, and washed or used by her; but nothing which has come to my knowledge leads me to believe that there was any foundation for that report, or that Mrs. Davis's illness can be connected with the arrival of the steamer, "Merlin." I think her disease arose from the unfavourable locality in which she was living.

The day week after she died, her husband, her eldest son (about eight years old), and a private of the 56th Regiment, residing in the same house, were attacked

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attacked with the same disease; but they had it more mildly, and they all recovered: they were sent into the military hospital. Two days after I was called in I reported Mrs. Davis's case to Surgeon Innes, of the 56th Regiment, as a case of yellow fever. He did not see the woman till the Friday evening before she died, about six o'clock. I also reported the case to Dr. Farr, who was then principal medical officer, and also mentioned it as a case of yellow fever to Major Oakeley, then in command of the regiment. This case was registered by me as a case of yellow fever. About the 24th of August I saw cases of yellow fever among the convicts on board the "Thames" hulk, in St. George's; it spread very rapidly on board that vessel. About four or five days after then, I saw at least 60 convicts lying on the deck of the "Thames" with yellow fever, and also some cases of convict guards and civilians in the town, one named Greylion. I also saw Cusack, who had the fever, and was then living in the nearest house to the convict hulk. He died of it; his wife and two of his children also died of it; and several other fatal cases. I was myself attacked on the 4th of September, and was on the sick list till the 3d of October. I went to Port's Island on 4th of October, in medical charge of the military hospital there, and continued there until the January following, and treated 117 cases there; and have seen in the course of the epidemic fully 300 cases (*see* answer to two additional questions to printed list). I remember the arrival at St. George's of the Spanish war steamer "Blasco-de-Yaray." In consequence of a fisherman named Swan having been run over by the steamer in coming into harbour and killed, I went on board with Dr. Frederick Hunter. The man was lying on the lower deck. I also visited the sick belonging to the ship with the surgeon of the ship, and I saw no case of fever. I dined on board, so did other officers of the garrison, during the time (about a week) she remained here, and there was a considerable interchange of civility between the officers of that ship and the officers of the garrison. She lay here about a week. I know of no reason to ascribe the introduction or increase of the fatal epidemic to the arrival of that steamer, her officers, or crew. I was the first officer of the garrison who had the fever; I was attacked 4th September. The next, I think, was Lieutenant Woodford, who was attacked on the 8th September. He died on Monday, the 12th; but I do not think either of the cases was contracted on board that steamer.

No. 57.

Oral Examination of *Esau Simmons*, of Paget Parish, Boatman, (aged 43 Years), taken the 3d day of April 1854, before the Commissioners.

Oral Examination of E. Simmons.

I REMEMBER the arrival of the British brigantine "Charles," Captain Taylor, from Demerara, at the Quarantine Ground, in Granaway's Deep, in October last. I took the health officer on board, when the quarantine signal was made for the vessel. She was at anchor when I went on board. I went on deck with the health officer. The pilot (I think it was Timothy Seymour) mentioned that the captain's wife was dead on board. After we got on board, the captain told the health officer that his wife was dead; that she died the day before their arrival here. The doctor asked him what was the matter with her. He said she had been sick before she left Newfoundland; that she had been advised to go to the West Indies with him on a trip for her health; and that in coming on here she got weak (and the captain also told me that he rather thought she was in a state of pregnancy). He said, that a few days after she left Demerara she began to get weak and languid, and would not eat anything; the most she would take was a little arrowroot with a little brandy in it, or a little brandy and water; that she died at last very quietly, and had her senses to the last moment. I asked him, as being from Demerara, whether she had died of fever. He said, no, she did not die of fever, but of debility arising from sickness she had before. I told him the reason I asked him whether she died of fever was, because I was very particular in going on board of vessels where there had been fever. He then told me there had been no sickness on board the vessel except his wife; and that the men had been doing all they could for his wife, and were worn out. I saw the crew on deck at the time, and heard nothing that day of any of them being sick. When I was coming away with Dr. Adolphus Harvey, the health officer, the captain asked

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asked me if he could get an air-tight coffin here to hold spirits, as he had plenty of rum on board, and that he would put the body in the coffin, fill it up with rum, and carry it on to Newfoundland. I told him I would come ashore directly and have one made. The doctor told the captain he thought he had better bury her on one of the islands, near the Quarantine Ground. The captain said he would not like to bury her on an island; would rather have her put in a churchyard in a burial-ground. The doctor said no more to him, and we shoved off. Before this, the doctor had gone below into the cabin, where the dead body was. I did not go below at all at any time. On our way coming down from the vessel to Hamilton in the boat, I asked the doctor whether she had died of fever; he told me she had no symptoms of it, and that he did not think that she had died of fever. On that same day I went to Messrs. Musson & Darrell, agents for the vessel; got from them an order to have an air-tight coffin made, and I went to Jackson, the carpenter, and ordered it. That evening about eight o'clock, I returned to the vessel with the coffin, and delivered it on board; I also went on board, but did not go below. The coffin was a square box, not in the shape of a coffin, made quite tight; seams were pitched. The captain asked me if there was a Catholic priest or a Catholic church here; he said his wife was a Catholic. I told him there was a priest here, but no Catholic church. Then I asked him what he intended to do. He said, he should take the body on to Newfoundland with him, and fill up the coffin with rum. I then handed him a note from Mr. Thomas A. Darrell (one of the agents for the vessel). The note stated that rather than they should carry the dead body to Newfoundland, he (Mr. D.) would allow it to be buried in his vault at Paget's Church. The captain said it was very kind of Mr. Darrell; he was much obliged to him, and would accept the offer. The next morning, according to Mr. Darrell's request, I made some arrangements to open the vault, and for the hearse to meet them at the landing-place near Paget's Church; and also acquainted Mr. Frith, the rector of the parish, that the corpse would be at the church at a certain hour, that day. About noon that day I returned to the vessel, then lying at the quarantine ground; the doctor went on board with me; as soon as we got there the coffin was passed out from the cabin, put in the boat, and we took it ashore; the captain came ashore with the body; it was landed at Paget's, met by a number of sea captains, who attended with the agents, and who took it to the church; I went to the church, met the clergyman there, and the corpse was buried there in Mr. Darrell's vault in the churchyard. There was not the slightest offensive smell from the coffin; I helped to lift it in and out of the boat. By the special order of the mayor, that no other boat was to go to the "Charles" but mine, I attended them every alternate day while she was here to carry them supplies; sometimes I went every day, successive days. I went to church, supposing the captain might want the boat to take him back to the vessel again. After the funeral was over the captain came down to the boat; he asked me if he could find a boarding-house, as his wife was dead and off the vessel, he did not wish to go on board again till the vessel was cleansed. He came across the harbour to Hamilton, and Messrs. Musson & Darrell had made some arrangements for him to board at Mr. Findlater's, near the Court-house in Hamilton. The captain gave me a scrip to carry to the mate for some clothes this evening; the next day I brought the clothes to Hamilton. The next day after the funeral I went alongside, but not on board the vessel; asked how they all were; they said, "All well" (the pilot had left the vessel the same day the vessel came to anchor; rather before the doctor left her, I think the pilot spoke to the doctor and had leave to go on shore). I was attending the hospital at Port's Island at the same time. On the third day after the funeral I luffed alongside the "Charles," on my way from Port's Island, with a couple of fowls for them and some bread; the doctor was not in the boat at this time; I did not go on deck, but passed up the fowls; the mate asked me where the captain was; I told him he was at Hamilton. I asked if he wanted him; he said, "Yes"; he did not tell me what he wanted him for. The day before that the doctor had asked me to take him on board this day; he appointed a time for going off with me. I went to the captain, told him the mate wanted him; that the doctor was going off, and he could go with us. The captain and doctor went off with me about noon to the "Charles." When we got alongside, the doctor went on board first, then the captain; I also went on deck. The captain asked the mate what was the matter. He told him one of the men was very complaining. The captain

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captain asked if he had given him any medicine. He said, "No." The doctor asked the captain if he had a medicine chest on board. He said, "Yes." The chest was brought on deck; the doctor opened it, and gave out some medicine for the sick man; I think he was the second mate. The sick man was standing upon deck; I saw him; he complained of violent pains in his limbs. I thought at the time the man looked more as if he was frightened. The doctor said he would come and see him next day, and left directions about giving him gruel, &c. The next day I went again with the doctor to the "Charles;" the sick man was on deck; they had a kind of awning over him; I did not go on deck then; I went no further than on the gunwale. The captain went with us, but did not go on board. While the doctor was on board the man was taken with spasms, convulsions; it took one or two men to hold him; he seemed delirious. He was, apparently, about 40 years old; a white man. The doctor gave him some more medicine, and said he thought he would not live the night out, and that he had no doubt he had the yellow fever. I saw him; he looked very yellow. We came ashore. The doctor and captain returned with me. The captain asked me that day to order a coffin in case the man should die. I went to the agents, and ordered a coffin from Jackson. The next day the signal was made from the vessel that the man had died. I took the coffin up that same evening. I passed it on deck, but did not go on board; the body was ready sown up in a hammock, and they put it into the coffin. I would not let it come into my boat; the ship's boat was hoisted out, the body put into it, and carried to one of the small uninhabited islands called Rabbit Island, and buried there, at a place which I pointed out to them, by the first mate and some of the sailors. In returning from the island to the vessel, I was towing the ship's boat, it was blowing fresh; the men were in the ship's boat. I asked them how they thought this man got the fever, and they said it must have been in the ship, for they lost a man by fever while coming from Demerara; and that the crew they had on board then, with the exception of two or three, was a fresh crew, for they had lost their former crew by fever at Demerara; this was spoken openly by the people in the boat. At the time they told me this, the first mate was in the boat, and a Portuguese passenger, who was said to have a great deal of money; and it was not contradicted by any body in the boat. On the day the second mate died, arrangements were made by the Board of Health for all the people in the vessel to go ashore at Burt's Island, for the vessel to be cleansed. One of the after hatches was open, and bad smells came from the hold. She was not full of rum, but had some Demerara mud, what they call "coddy," for ballast; the rum was on it.

The captain told me himself, the afternoon the man was buried, they had a lot of this "coddy" on board for ballast, and he did not want to go away until he had got some chloride of lime to purify the vessel. The day after the funeral the men were moved to Burt's Island, and no more sickness occurred among them. I don't know whether she was purified or not. Two days after the man was buried I carried some stores up for them, but would not go alongside the vessel; they took the things out of my boat into their boat at the island. No people went from the shore to cleanse the vessel that I know of. The "Charles" arrived at the quarantine ground on a Monday, and sailed for Newfoundland the Sunday following. I believe mine was the only boat alongside from the shore, while she was here, except the pilot's boat. At the time the "Charles" was at the quarantine ground, the hospital at Port's Island was occupied by fever patients of the troops, who had gone there the day before the "Charles" arrived. The "Charles" lay about half-way between the mainland and Port's Island.

On the Sunday morning she went to sea, I took the captain on board. He then told me himself that they had lost a man by sickness in coming from Demerara, and that he did not like to go to sea without having the vessel cleansed.

Some time before the "Charles" arrived there had been many deaths from fever at St. George's, at Ireland Island, and also at Hamilton.

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No. 58.

Oral Examination of Private *Thomas Derring*, 56th Regiment, taken the 12th day of April 1854, before the Commissioners.

Oral Examination of Private Thomas Derring.

Was stationed at Paget Island before the fever broke; remembers Mrs. Davis's illness; Davis, her husband, has left Bermuda. This witness was employed on Paget Island for several months before Mrs. Davis's illness; was working as a gardener near the house where she lived; was in daily communication with the house where she and her husband lived; had no reason whatever to believe that Mrs. Davis ever picked up any bundle of clothes which drifted ashore; and if such a thing had happened this witness must have known it. After Mrs. Davis's death, this witness went to live in the house where she had lived; stayed there with her husband. A week after her death, this witness, and Davis, and Davis's son, were all attacked with fever; on my recovery I first heard a rumour of Mrs. Davis having picked up a bundle of clothes; for which rumour I believe there is no foundation.

No. 59.

Oral Examination of Surgeon *Innes*, 56th Regiment, taken on the 14th April 1854, before the Commissioners.

Oral Examination of Surgeon Innes.

I remember the arrival of the Spanish war steamer "Blasco de Garay," at Bermuda in August last. I was acquainted with several of the officers of that ship, and was frequently on board. I went all over the ship, and especially visited the sick bay, in company with the surgeon of the ship; there appeared to be no case of fever on board. Before going on board, I had inquired of the surgeon if there were any cases of fever on board; he assured me there were none; nor did the sick whom I saw appear to be labouring under fever. I conversed with the surgeon of the ship in French. When I visited the sick bay of the ship, assistant-surgeon Deeble was not with us, although I have heard that he also visited the sick bay of the ship on another day.

During the stay of this ship at Bermuda, I was frequently in company with her officers both on shore and on board; and nothing ever came to my knowledge, leading me to believe that she had fever on board, or that the epidemic here could be attributed to her arrival.

No. 60.

Oral Examination of *Israel Burcher*, of St. David's Island, Pilot, aged about 38 years, taken the 17th day of April 1854, before the Commissioners.

Oral Examination of Israel Burcher.

I am a branch pilot, and have been so about 18 years. I reside at St. David's Island, at the east end, on the south side of St. David's Island, near St. David's Sound, in Mr. Barr's cottage.

I remember the steamer "Merlin" arriving from St. Thomas, in June last. I was pilot of her. I took her first to the quarantine ground in St. George's Harbour, near the entrance of the harbour; anchored there, because I was told there was the dead body of a lady on board; anchored about 7 a.m.; boarded the vessel about 4 a.m. I was told by Captain Cronan that the lady had died about five minutes before I got on board. The captain said he thought she died broken-hearted, because she had to leave her husband, who was the captain of some collier ship in the West Indies; that she came on board the "Merlin" at St. Thomas, and brought two children with her; that she was ill when she came on board. One of the children was about six years old, the other three or four months, not weaned. I remember there was a doctor on board, a passenger. Outside the harbour I did not hear him say anything about the cause of the lady's death; but after the health officer (Dr. Frederick Hunter) came on board, and after the body of the lady had been brought on deck, on a stretcher, the

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the doctor, who was a passenger, told me that he thought she might have died of fever. I saw the lady's face; she looked quite yellow, like the bodies which I have seen since of white persons who died of yellow fever. A coffin was brought from the shore, and the corpse was put in it, on the quarter-deck, by some of the crew. I did not assist or touch the body at all. At that time there was no alarm about fever in Bermuda. I had not heard of a single case of fever in Bermuda at that time. The body of the lady was taken on shore the same day to be buried, in the ship's boat. The captain, the mate, and the engineer went with it; some of the passengers had gone ashore before. There were as many as eight or nine passengers. After the body was taken ashore I went below to the cabin, to get my breakfast. The two children were in charge of the stewardess in the berth which had been occupied by the deceased lady, as I was told by the second mate. The captain came on board again about half-past 3 P.M.; the passengers stayed ashore. About noon the children were taken ashore by the stewardess, in a shore boat; they did not come on board again that day. I neither saw nor heard of any clothing or bedding being thrown overboard from the steamer, either before or after she came into port; I carried nothing of the sort ashore. I did not see or hear of any fumigation or smoking of the cabin where the dead body had been. The children were taken to Mrs. Swainson's house, in the town. I did not hear of any sickness at Mrs. Swainson's afterwards. Mrs. Swainson obtained a nurse to go on to New York with the children; the nurse was the wife of Mr. John G. Allen, of St. George's; she came back to Bermuda the next voyage. I did not hear of her having the fever. I remained on board the steamer that night, being short of coal, and not able to obtain it at St. George's. The next morning, between 3 and 4 A.M., got under weigh, and proceeded to Ireland Island, where she was coaled, in the Camber, by convicts; the convicts only wheeled the coals on board, they did not go below. The steamer returned to St. George's that day, about 4 P.M. Went into the harbour there, and lay off Ordnance Island. The passengers, and the two children with the nurse, came on board that evening. The next morning a lady passenger for New York (Mrs. Musson) came on board, and the steamer got under weigh about 5 A.M., and proceeded to sea. I returned home about 7 A.M. I have no children; myself, my wife, and a young woman living with us, were all of my family. About a week afterwards my wife was taken with headache and pain in her limbs, to which she has been subject every summer on taking the least cold; this attack of my wife was similar to attacks she had had before. No doctor attended her. She used some sage tea and warm baths, and got well in about three days. I don't consider she had yellow fever. About three days after my wife got out, the young woman living with us (Rachel Trott) was taken ill, something in the same way as my wife, with headache and pain in her bones. She got well in three or four days. No doctor attended her. I did not think she had yellow fever. I was not ill myself at all, then or since.

I know the family of Benjamin Fox, the pilot, who lives on St. David's Island, about a quarter of a mile from where I live. His oldest son, John Fox, about 21 years old, went away as a seaman in some American vessel, early in 1853, and never returned. It was reported that he died at sea, of yellow fever, after having been at New Orleans. I heard afterwards that his clothing was brought home in the "Princess Royal" from New York. Benjamin Fox was pilot of that vessel, but would not bring the clothes on shore; the captain afterwards sent them ashore to St. David's Island. I heard they were put in an out-building separate from Fox's house, and he would not allow them into his house.

The first case of yellow fever I heard of was at St. David's Island; it was that of Samuel Fox, a younger son of Benjamin Fox, aged about 10 or 12 years. He died after a few days' illness. Samuel Fox had not been at my house that I know of, nor any of my family at his house. His father said that Samuel died with black vomit. Before I heard of Samuel Fox's illness, I had heard that his brother's clothing (which came in a bag) had been opened and washed at the sea side by one of his sisters, Jane, who died some time after him. I heard that the clothing was used in the family, but I don't know when. I have heard Mr. Benjamin Fox say that it might have been the case that his son Samuel took the fever from his brother's clothes. Samuel was too small to wear his brother John's clothes, but he had another brother, about 15 years old, named Joseph, who, I

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Oral Examination of Israel Burcher.

heard, had a slight touch of the fever, after his sister died, and after the fever had become general in St. George's.

After Samuel Fox's death, and after cases of fever at St. George's, I heard o the daughter of James Smith, of Smith's Island, having the fever. She recovered. This was about the time of the middle of the fever. I had heard of sickness on board the "Thames" before Samuel Fox's death; they called it the cholera. I did not see any of the cases. I had frequently noticed a bad smell from the "Thames" in passing along the road, even before the gale, when she started her moorings; about a week after then the smell was very bad. Lately, since the "Thames" has been taken out into the stream of the harbour, I have noticed a bed of mud in the place where she used to lie; at low tide the water would be about three feet deep there, above the bed.

No. 61.

Oral Examination of *Thomas Pierce*, Quartermaster of the "Thames" Hulk; taken the 25th day of April 1854, before Colonel Oakeley and the Solicitor-General.

Oral Examination of Thomas Pierce.

I HAVE been quartermaster on board the "Thames" hulk for the last three years, and was on board of her the whole time the fever raged in 1853. I know that the sanitary precautions directed by Governor Elliot were regularly observed down to the time when the fever began, in August. I was in the "Coromandel" hulk at the naval yard all through the fever of 1843, and from all I saw of that sickness, I consider that the case of Robert Hall, a convict on board the "Thames," was one of yellow fever; and I think there were many other cases of yellow fever on board the "Thames" at the time Mr. Howes took charge of her. I had charge of the between decks of the hulk "Thames," and know that down to the time the fever began she was clean, and that every precaution was taken to preserve health. No prisoner had been confined for any length of time in the black hole (that is, for more than a few hours at a time) for a month or more before the fever broke out. I have no reason to believe that the fever on board the "Thames" was occasioned by the employment of the prisoners between decks, nor by any other work they had to perform. In the gale of wind in August the position of the hulk was changed to about six feet more in shore, and she worked a great deal during the gale. The mud and filth around the hulk were often cleared away, and were so in the last spring. I think there was less of it at the time of the gale than at some former periods. The men attacked by fever were for the most part of good behaviour and character. During the months of June and July several of the prisoners were severely attacked with cholera. I remember no change of prisoners or guards on board the "Thames" for some time previous to the outbreak of the fever. There was no frequent intercourse between the "Thames" and Boaz Island. About once a week boats would come to the "Thames" from Boaz Island for the sick, or on other duty, when telegraphed for; but when the fever became very bad, the sick bay was overcrowded, and the patients had to lie along the decks. I believe there was no intercourse between the "Thames" and the Spanish steamer. There has been no military guard over the convicts for three years past, except after the death of our guards during the fever. A sentinel was posted on the parapet on the hill above the "Thames."

No. 62.

Table distributing Mortality from Endemic Homigastric Fever at the various Stations occupied by Troops, from August to December 1853.

STATIONS.	Average Strength of Troops.	OFFICERS.		MEN.		WOMEN.		CHILDREN.		TOTAL.	
		Attacked.	Deceased.	Attacked.	Deceased.	Attacked.	Deceased.	Attacked.	Deceased.	Attacked.	Deceased.
Royal Barrack and Ferry Point	339	3	1	252	99	11	6	24	7	283	114
Military Prison	15	–	–	13	7	–	–	–	–	13	7
Officers' Quarters	27	6	2	26	20	–	–	–	–	32	22
Fort Cunningham	28 Sept.	–	–	11	4	1	1	1	–	13	5
Fort Victoria	69 A.	1	1	81	44	1	1	1	–	84	46
Fort George	57	–	–	26	6	1	–	–	–	27	6
In Lodgings	28	13	8	12	7	8	6	–	–	33	21
Prospect	288 Nov.	–	–	52	17	1	1	1	–	54	18
Oxford	60	–	–	5	1	–	–	–	–	5	1
Tucker's Island	156 Nov.	–	–	3	–	–	–	–	–	3	–
Ireland Island	442 Sept.	3	–	63	26	2	–	1	1	69	27
Hamilton	74	–	–	15	5	–	–	–	–	15	5
Port's Island	81 Nov.	–	–	17	9	–	–	–	–	17	9
In Tents, at St. George's	- - -	–	–	16	8	12	8	23	6	51	22
Fort Albert	- - -	–	–	8	2	1	–	–	–	9	2
Fort Catherine	- - -	–	–	6	1	–	–	–	–	6	1
Artillery Quarters	- - -	2	2	4	2	1	–	–	–	7	4
Hen Island	2	–	–	2	2	–	–	–	–	2	2
Lodgings, Royal Artillery	- - -	3	1	20	10	16	3	16	4	55	18
Ordnance Hospital	- - -	–	–	7	5	1	–	1	1	9	6
Royal Sappers and Miners' Barracks, St. George's	48 Sept.	–	–	36	20	3	1	–	–	39	21
Western Redoubt	1	–	–	1	1	1	1	–	–	2	2
Lodgings, Sappers and Miners	- - -	–	–	1	1	1	1	–	–	2	2
Mount Langton	12	–	–	–	–	2	–	–	–	2	–
Gibbs Hill	4	–	–	–	–	–	–	–	–	–	–
		31	15	677	297	63	29	68	19	839	360
CORPS:											
Royal Artillery	147	7	3	91	48	20	3	18	5	136	59
Royal Sappers and Miners	88	4	2	48	25	8	4	3	–	63	31
56th Regiment	1,005	15	6	535	222	30	20	40	12	620	260
Ordnance and Commissariat Department	- - -	5	4	3	2	5	2	7	2	20	10
Total		31	15	677	297	63	29	68	19	839	360

This Table has been compiled with great care, as each individual case has been examined, and is, with its result, attributed to the station where the malady probably originated.

1. It was found impossible to separate the total number of sick occurring in St. George's from those at Ferry Point, after encampment, as they were generally both treated indiscriminately at the same hospital; and all the early cases of fever at the latter station were probably contracted at the former.

2. Fort Cunningham. The actual number of casualties on this detachment was, 13 attacks and eight deaths; 11 of the first and four of the last could only be attributed to Fort Cunningham.

3 and 4. Forts Victoria and George. An unfair deduction would, without explanation, be drawn from the very disproportionate mortality at these two stations. In comparing them, the numbers at Fort George must be stated as follows:—Men attacked, 59; men died, 31; which represents the actual loss of the detachment; but of these 36 attacks and 25 deaths were clearly attributable to extraneous sources; it thus appears that of 23 attacks originating here only six died; and of 36 elsewhere, 25 died. With Fort Victoria all its garrison were so continually employed in general fatigues that this separation could not be made.

5. Prospect Hill. On the above principle, the casualties at this station represent only the number who appeared to have contracted the disease on the spot, and not to have imported it.

(signed) *S. Oakeley*,
Lieutenant-Colonel, 56th Regiment.

Bermuda, 29 April 1854.

Appendix.

No. 63.

Epidemic at St. George's.

At a late hour last night we received, by dispatch from St. George's, the subjoined letter. Hoping it may have the effect contemplated by the writer, of quieting the public mind to some extent, we stop the press to give it a place in our to-day's impression. We avail ourselves of the privilege granted us, and affix the writer's name, feeling assured that greater reliance will in consequence be placed in the information therein conveyed.

To the Editor of the "Royal Gazette."

My dear sir, St. George's, Monday 5th, 4 P.M.

Dr. Innes's Letter to the Editor of the Gazette.

So much anxiety prevails on the subject of the existing epidemic at St. George's, that the positive data with which I can furnish you may perhaps have the effect of quieting the public mind.

Yellow fever presents two varieties, the one which is specially so called, of a highly inflammatory kind, running rapidly its fatal course, and diffusing around it its malignant influence; the other of a milder form, more insidious in its approach, slower in its progress, and by far the less fatal. To the latter class belongs the disease which has of late, and not causelessly, created so much alarm. Its first appearance was in a house near Fort Cunningham, and which in the person of the wife of a soldier of the 56th Regiment proved fatal, after a severe day's illness. The "Thames" convict hulk has simultaneously invaded; and up to the present time, 30 convicts and six guards have become its victims; while, with but few exceptions, all the inmates of the ship have succumbed to its influence. This large mortality is evidently in the present instance due to its concentration.

The "Cassius" having been moored in St. George's Harbour, the convalescents and healthy were, in the middle of last week, transferred to its deck, since which measure the virulent nature of the fresh cases has much abated. On Sunday the "Weymouth" was brought from Ireland, and the sick at once transferred to her. No fresh instances of illness have occurred, although several of those previously affected will probably terminate fatally.

In the town of St. George a few scattered instances of its presence have been felt, a circumstance by no means surprising when the sad condition of many of its ill-constructed and crowded dwellings, with its narrow and ill-ventilated alleys, is considered.

The garrison, too, has come within its influence, but amongst the soldiery the cases which have of late appeared have been of an infinitely milder nature than those at first admitted to the regimental hospitals. In the 56th Regiment, three men and one woman have died, but the only ones considered at present of a precarious nature are those which came under treatment before the 2d instant. In the Artillery and Engineers, likewise, the mortality, which has been confined to one of each corps, does not seem likely to extend itself.

The detachment at Fort Cunningham, where its germ first grew, has yielded a greater amount of disease than other localities, in consequence of which they have removed their camp to the Ferry Point. The married families of the regiment have also been ordered to vacate the town and take up their quarters under canvas in the rear of the barracks.

You are quite at liberty to make any use of this communication you like; but however you may use its substance, I do not wish my name to be appended to it unless you yourself are particularly anxious for the same.

Yours, &c.
(signed) *I. H. K. Innes.*

EPIDEMIC (BERMUDA).

COPY of a DESPATCH from the Governor of *Bermuda*, enclosing a REPORT from the Commissioners appointed to inquire into the Origin of the EPIDEMIC which lately prevailed at *Bermuda*.

(*Mr. Peel.*)

Ordered, by The House of Commons, *to be Printed,*
23 *December* 1854.

[*Price* 1 *s.* 8 *d.*]

16.

Under 24 *oz.*

BERMUDA (YELLOW FEVER).

RETURN to an Address of the Honourable The House of Commons,
dated 23 July 1866;—*for*,

"COPY or EXTRACTS of a DESPATCH from the Governor of *Bermuda* to the Secretary of State for the Colonies, forwarding the REPORT of the COMMITTEE appointed to inquire into the Origin and Spread of the YELLOW FEVER, by which *Bermuda* was visited in 1864, together with the Appendices."

Colonial Office,
3 August 1866.

C. B. ADDERLEY.

(*Mr. Adderley.*)

Ordered, by The House of Commons, *to be Printed,*
4 *August* 1866.

477.

EXTRACT from a DESPATCH from the Governor of *Bermuda* to the Secretary of State for the Colonies, forwarding the REPORT of the COMMITTEE appointed to inquire into the Origin and Spread of the YELLOW FEVER, by which *Bermuda* was visited in 1864, together with the Appendices.

Governor Colonel Ord, R.E., C.B., to the Right Hon. Edward Cardwell, M.P.

EXTRACT from a DESPATCH from Governor Colonel *Ord*, R.E., C.B., to the Right Honourable *Edward Cardwell*, M.P.

Bermuda, 17 November 1865.
(Received 16 December 1865.)

Sir,

I HAVE the honour to forward the Report of the Committee appointed by direction of Her Majesty's Government under the instructions conveyed in your Despatch No. 39, 24th December 1864, to inquire into the origin and spread of the yellow fever by which Bermuda was visited in that year, together with the Appendix of the Report, statement of the disbursements of the Commission, letter of the Attorney General to the Lieutenant Governor administering, and covering letter to you from the Lieutenant Governor containing his observations on the Report.

As Colonel Hamley was in the administration of the Government during the whole course of the epidemic, as well as during the progress of the inquiry, it is not necessary that I should offer any comment upon the Report.

* * * * * *

I have, &c.
(signed) *H. St. George Ord.*

Lieut. Governor Colonel Hamley, R.E., to the Right Hon. Edward Cardwell, M.P.

COPY of a LETTER from Lieutenant Governor Colonel *Hamley*, R.E., to the Right Honourable *Edward Cardwell*, M.P.

Sir,

Bermuda, 16 October 1865.

I HAVE the honour to transmit herewith the Report, with appendices and maps, of a Commission appointed in the spring of this year to inquire into the origin and spread of the epidemic fever which was so fatal in Bermuda in the last six months of the year 1864.

The Commissioners, after very industrious research, have recorded the history of the fever fairly and faithfully. Most of the incidents had been previously known to me, and had, in some form or other, been committed to writing. I am able, therefore, to bear testimony to the fidelity with which the whole sequence of events has been traced in the Report.

The satisfaction is denied me of being able to announce that the inquiry has unveiled, even partially, the cause of the fever. Well known sanitary maxims are referred to and repeated, and inattention to them is condemned. But when it is remembered that the fevers appear at intervals, with many intervening years of great salubrity, it is hard to understand how the state of the buildings, drainage, &c., can be the cause of the pestilence; because they (the buildings, &c.) remain from year to year much in the same condition, and if they generate and emit a poisonous influence, that influence must operate constantly, though not necessarily, to the extent of producing every year yellow fever. There is, however,

ever, no evidence of such constant operation, for, except in epidemic years, the population is singularly healthy. I am disposed, therefore, to reject the idea that the state of our towns and buildings accounts for the appearance of the fever.

With regard to the spread of the epidemic, a different conclusion seems warranted. After it had once begun, there is every reason to believe that it was fostered and propagated through the absence of sanitary precautions. In many communities such an admission would amount to a reproach. I am concerned, therefore, that the Commissioners did not, in justice to Bermuda, set forth the disabilities under which the Colony labours, as, for example, that no civil engineer or even master builder is to be found here; that the whole population is under 12,000 souls; that this population is poor; and that labour and the appliances of art are exorbitantly dear.

It is shown that one measure—not a profound or scientific one—was resorted to with good effect, namely, flight. It is, to the best of my belief, the only reliable mode of escape. It was, last year, undoubtedly the means of saving many lives; and I entirely concur in the opinion of the Commissioners that the means of transport should be at hand every summer.

A statement in the Report requires, I think, some remark from me. It occurs in paragraph 43, where I read that: "When the troops were removed from the vicinity of the town of St. George, it was, unfortunately, not foreseen that it was necessary that the head quarters, the sick, the civil departments, and the commissariat stores, should be removed at the same time. This course not having been taken, it became necessary to send back men from the distant camp on numerous duties of fatigue; 38 per cent. of these men died." Now, though it was quite practicable to move the soldiers, with their arms and knapsacks, to Ferry Point, the Commissioners have omitted to explain how the military chest, stores, &c., could have been moved thither so as wholly to prevent communication. The bread was all baked in St. George's, the meat was there slaughtered by the contractor; the coals, wood, bedding, utensils, medicines, camp equipage, and engineer yard were there. To have suddenly transferred every department and store would have been impossible, even had there been places convenient for their reception at Ferry Point, and had labour abounded. But the ground at Ferry Point is a barren moor, and the Commissioners have shown that labour, far from abounding, was at first scarcely procurable at any price. The inference is that the communication between Ferry Point and St. George's, however unfortunate it may have been, was attributable not to want of provision, but to necessity. Were an epidemic to occur again under the same circumstances, the soldiers must perform the same duties between the camp and town. But it is not to be expected that the population will again be absorbed in such a pursuit as running the blockade; native labour may, therefore, be counted on to relieve, in a great measure, the troops from the danger of communication.

The Commissioners advocate the employment of black troops in Bermuda. I think that a small number, say 50 men, would always be useful, and that in time of sickness they would be especially so, as hospital orderlies, boatmen, carters, and grave-diggers.

I beg attention to the fact stated in the Report, that the 2nd Battalion, 2nd Regiment, never were in barracks from the time of their landing till after the disappearance of the epidemic.

I have, &c.
(signed) *W. G. Hamley*,
Lieutenant Governor and Commander in Chief.

COPY of a LETTER from *S. B. Gray*, Esq., to Lieutenant Governor Colonel *Hamley*, R.E.

S. B. Gray, Esq., to Lieut. Governor Colonel Hamley, R.E.

Sir, Hamilton, Bermuda, 11 October 1865.

I HAVE the honour to forward herewith the Report of the Commissioners appointed by your Excellency, under a Commission bearing the Great Seal of these Islands, to inquire into the history and circumstances of the Yellow Fever Epidemic of 1864.

The Report is accompanied by appendices, marked from (A) to (R) inclusive.

In pursuing their investigations the Commissioners have received the greatest assistance not only from your Excellency and the other principal officers of Her Majesty's land and sea forces, but from many medical and other officers of the various corps and departments, military and naval.

To the medical practitioners of the Colony and to the civil authorities and public bodies generally, the Commissioners are under similar obligations.

For the diagram and chart, forming the Appendices (O) and (P), the Commissioners are indebted to Captain Walker, R.E.

The meteorological register, marked (R), which, though imperfect, is the most reliable and complete that could be obtained, we have to thank Captain Pullen, R.N., the officer in charge of the naval survey, for, he having kindly placed his log at the disposal of the Commissioners.

I have, &c.
(signed) *S. Brownlow Gray*,
Attorney General.

(Enclosure.)

REPORT of the COMMISSIONERS on the YELLOW FEVER EPIDEMIC of 1864.

Sir,

HAVING made a careful inquiry into the circumstances connected with the first appearance and progress of the epidemic of yellow fever which prevailed in Bermuda during the year 1864, agreeably to the instructions forwarded to us in your Excellency's letter of the 24th April 1865, and under the authority of a Commission of the 20th April 1865, bearing the Great Seal of the Colony, addressed to ourselves,

We have now the honour to submit to your Excellency the results of our investigation, embodied in the form of a report.

2. We considered that the most convenient method of obtaining reliable information would be to frame different sets of questions and forms for returns, as was done by the Fever Commissioners in 1854 and 1857. These, when printed, could be addressed to the members of public departments, both civil, naval, and military, as well as to the medical practitioners, the health officers, and the magistrates of the respective parishes, and such other persons as were likely to possess valuable information.*

3. Two sets of questions and five forms for tabular returns were accordingly framed, printed, and circulated, and we are able to state that in almost every instance answers have been returned. Copies of some of them, containing useful evidence bearing on the subject of the present inquiry, or offering suggestions of material value, will be found inserted in the Appendix.† Extracts from others, either of intrinsic value or tending at least to show what diversities of opinion still exist on the much vexed questions submitted to the Commissioners, are also appended.‡ Many others have assisted us in framing the present report, or furnished valuable information, of which we have freely availed ourselves in arriving, as far as we have been enabled to arrive, at general conclusions.

4. We further considered it necessary to make a tour through the islands, to enable us to become personally acquainted with the general features of the country, and the particular localities where the fever first appeared. We also inspected the barracks and Government buildings, and the various military works, both at St. George's, Boaz Island, and Ireland Island, and the naval establishment

* *See* (D) and (E) in Appendix.

† *See* (F) and (H) in Appendix.

‡ *See* (G) and (I) in Appendix.

ment at the last-named island, including the dockyard, the naval hospital, and the hulks.

5. Nearly all the resident medical practitioners affirm that the year 1864, up to the first appearance of the epidemic, was an ordinary one as regards the general health of the civil population. Dr. Foggo, of Devonshire parish, states, however, that he had many cases of influenza, diarrhœa, and dysentery; and Dr. Rees, of the town of Hamilton, remarks that he treated a few cases of remittent fever. Dr. Brice, surgeon, Royal Navy, also observed several cases of febricula and diarrhœa at Ireland Island. The military and naval medical officers generally are of opinion that there was nothing unusual in the nature of the diseases under treatment, nor have we evidence of any merchant ship having, prior to the appearance of the epidemic, arrived with fever prevailing on board, or in a generally sickly condition.

Some few cases of bilious remittent fever, as well as of diarrhœa, are met with in the summer and autumn seasons every year in Bermuda. In St. George's, where the epidemic was most virulent, the medical men declare that they had no warning of the approach of the pestilence. There was an uneasy feeling, however, on account of the overcrowded state of the town, which had received a large addition to its ordinary population, in the shape of sailors of dissolute habits, and others engaged in running the blockade established on the American coast. Probably the knowledge of the very defective sanitary state of the town was also one cause of the uneasy feeling which prevailed. It appears to be tolerably certain that in several essential particulars the sanitary condition of the town of St. George was much worse than when Bermuda was visited by the terrible epidemic of 1853. The same want of drains and sewers existed, but with it there was far more overcrowding of confined and ill-ventilated tenements and lodging houses, with the necessary, or, at least, natural, accompaniments of a generally more filthy condition of the streets, lanes, alleys, and waste land of the town. To complete the mischief the wharves were now loaded with large piles of cotton, coals, and other goods, which not only were unwholesome in themselves, but tended materially to check the circulation of air through the houses and narrow thoroughfares. No sporadic case of yellow fever had been observed in any of the islands.

6. A full description of the disease, as it appeared during the late epidemic, as well as of the medical treatment and "after death" appearances, will be found in the Appendix (A).

7. The tables showing the statistics of the epidemic among the civil population and the troops, as well as in the dockyard, are also added as appendices.*

* *See* (J), (K), (L), and (Q) in Appendix.

8. The climatic conditions during the year 1864, as far as we have ascertained, were those of ordinary years. There was nothing unusual as regards the quantity of rain, the range of temperature, the force and direction of the winds, or the electrical or hygrometric state of the atmosphere. Nor was there any particular lowness of the tides, such as was noticed previous to the epidemic of 1856. We are altogether unable to determine that there were any special predisposing climatic conditions in operation which were likely to have acted injuriously upon the health of the population. It is much to be regretted that there are no sufficient data in existence from which meteorological tables of practical value could be prepared.†

9. The state of blockade enforced on the Southern American ports had a decidedly injurious influence on the general health of the population in several respects. A large number of blockade running steam ships was constantly arriving at, and departing from, the harbour of St. George, remaining in port on the average about a fortnight. To supply these steam ships with coal, many sailing vessels were sent out from England, which were moored alongside the wharves, in order to discharge their cargoes. The waters of the harbour could not but be materially affected by the quantity of refuse matter thrown out of these vessels. In addition, the offal and blood from two slaughter houses (one

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† In Appendix (R) will be found the most complete Meteorological Tables which the Commissioners could obtain. These are extracted from the log of Captain Pullen, R.N., in charge of the Naval survey at Bermuda, by his kind permission; but, in consequence of the illness of himself and his staff of assistants, there is a hiatus at a period of considerable interest.

of which was on the Market-square, in the centre of the town,) were thrown into the harbour, and might be frequently observed floating about in a state of putrefaction in the narrow channel between Ordnance Island and St. George's. The entrails of fish were constantly thrown into the same channel, where they underwent a process of slow decomposition. The harbour of Hamilton also suffered from these causes, but to a far less extent, the number of blockade running and other vessels frequenting that port having been comparatively trivial. The health of the crews of the ships suffered from the faulty construction of the vessels, which were built specially for speed, with but little height between decks. A proper circulation of air was altogether prevented by the necessity which existed for filling every available space with coal and general cargo. The crews in general were very dirty and dissipated, and entirely without discipline. At night the men were crowded into a very small space, where the temperature must have been exceedingly high, and the atmosphere almost poisonous.

10. On shore the houses, as before stated, were greatly overcrowded at St. George's. On all sides numbers of dissipated, lawless, and dirty sailors, firemen, &c. were seen, and they were generally, more or less, drunk, and always in a state of perpetual debauch.

11. It has already been noted that no improvements had been made in the town of St. George's since the last epidemic, and that its state, in fact, was decidedly worse. The streets consisted of the same narrow and tortuous lanes, in which most abominable odours were rife. There were no pavements, and there was an utter absence of drains and sewers. Cesspits abounded, and those can be found who even declare the cesspit system to be a desideratum in a town situated like St. George's. These privies, sure foci of disease, were emptied at rare intervals indeed.

12. The water supply is generally insufficient for the population, and always fails in unusually dry seasons. Rain water is almost universally made use of in Bermuda for drinking and cooking purposes. It is collected from the roofs of the houses; but in the country sometimes the rocky slope of a hill is selected, which, for this purpose, is smoothed and cemented. The water is conducted into underground tanks, which commonly are cavities cut out of the solid rock and well cemented. On the whole, the water is pure; but in the towns the tanks are often placed near the privies. Nor is it an unusual thing in Bermuda to see cisterns placed immediately under the dwelling-houses, a situation which in other countries visited by yellow fever epidemics is considered highly injurious to the sanitary condition of the residence.

13. The shipping also derived its drinking water from tanks; and it is not believed that the quality was otherwise than pure, though, from the fact of its having to be carried to the ships from considerable distances, the supply could not but have been scanty in the Port of St. George.

14. Wells are sunk in different parts of the group of islands. The water in some of them is scarcely brackish, and in dry seasons is largely made use of.

15. In the main island, to the north and west of the town of Hamilton, there are tolerably large saltwater marshes, which are affected by the state of the tides. It is not noticed, however, that fevers prevail in their vicinity more frequently than elsewhere; and it may be said that intermittent fevers are all but unknown. There is no specific information or evidence to prove that these marshes have an injurious effect on the health of individuals living near them, or of the population generally, although it may be suspected to be the case during an epidemic season. The same may be stated as regards the creeks. When the tide recedes, a quantity of mud is often exposed, and offensive emanations are occasionally thrown off; but there is no proof that the people living in the immediate vicinity suffer from any particular sickness. They enjoy, on the contrary, as good health as those residing at a distance, even on high ground.

16. No burials are allowed in the towns. At St. George's the dead are buried at a cemetery nearly a mile removed from the town; but the military graveyard does not appear to us to be situated at a sufficient distance from the troops. In Pembroke parish the burial ground surrounds the parish church, which is nearly a mile from the town of Hamilton. In the town itself no interments take

place. But the practice of surrounding the parish churches with burial grounds, which prevails everywhere in these islands (except in the case of St. George's, where it has been recently abandoned), is one open at all times to very serious objections in tropical climates; and in times of yellow fever epidemics especially such cemeteries ought immediately to be closed.

17. We will now state the results of our inquiries into the origin and progress of the late epidemic visitation.

Dr. Outerbridge, a medical practitioner at Bailey's Bay, reports that a coloured man named Henry Tucker was the first person attacked, and that this case occurred on the 19th June. This man and a brother were living with their father at a place called "Devil's Hole," south of Harrington Sound, in Smith's Parish, their house being about six miles south-west of the town of St. George's. The father, John Tucker, was next attacked on the 21st June, and was seriously ill for a fortnight. Both these men had been at work previously at St. George's, coaling ships at West's Wharf, which is situated in the western suburb of that town. All the wharves of St. George's were in the same overcrowded state from coal, cotton, lumber, and merchandise. They were rarely or never swept or cleansed. Coal-dust, mud, and filth of all kinds were allowed to accumulate on all sides. It may be here remarked that all the early cases of fever were met with in the locality where the Tuckers were employed, or rather extending from these wharves to higher land situated directly to the north.

18. No communication has, however, been traced between the parties first attacked. The deduction is, therefore, that the concentration of the fever in this quarter depended upon some peculiar local influences. Neither Henry nor John Tucker had been on board any vessel from Nassau in June. That island was declared an infected port on the 14th June, the day after the steam ship "Fannie," a blockade runner, arrived at Bermuda, and brought the news that yellow fever had just broken out at Nassau.

20. Dr. Outerbridge states that Christopher Tucker, a brother of Henry, was the third person attacked. The date of seizure is uncertain, but it probably was the 24th June. This man was so slightly affected that he was never confined to his bed. Christopher Tucker had been employed at Fisher's Wharf coaling the steam ship "Fannie," from Nassau, and believes he contracted fever while in that vessel.

21. Although there appears to be some uncertainty about the exact nature of the fever in these three cases, there can be none with regard to the next, that of Alton, a European, who left Nassau on the 9th June in the steam ship "Fannie," and arrived at Bermuda on the 13th June. During the four days' voyage, Alton suffered from tertian ague. On the 18th June he applied to Dr. Hunter, of St. George's, for medical advice, when the disease was at once recognised as tertian ague, and was treated accordingly. Alton lived at a Mrs. Walshe's, whose house was situated to the rear of the gaol, far to the north of Fisher's and West's Wharves. The house stands on ground well elevated above the surface of the sea, but surrounded by hillocks which are covered with bush and trees. The general sanitary condition would be considered bad. Mrs. Walshe declares she saw Alton have three separate attacks of tertian ague, and that he was quite well in the intervals, and walked about the town enjoying himself. He could foretell the time of an attack to an hour. On the 23rd June he felt very unwell, and was again seen by Dr. Hunter. The fever assumed a continued type on the 25th, and presented a suspicious resemblance to yellow fever. He became worse, and died with black vomit on the 30th June, his skin being intensely yellow.

22. The history of the steam ship "Fannie" is as follows: She left Nassau on the 9th June, where a few fatal cases of yellow fever had already occurred, and arrived at St. George's, Bermuda, on the 13th June. A man who was paralytic and Alton were the only two sick persons who are satisfactorily ascertained to have been on board. Alton had suffered from intermittent fever during the voyage, and after landing had, at least, three attacks of tertian ague. Six passengers also disembarked, none of whom were seized with yellow fever, as far as can be discovered. Three firemen deserted from the ship, and their history cannot be traced. On the 15th June, the "Fannie" (having coaled at Fisher's Wharf) sailed for Scotland, where she arrived without any case of sick-

ness whatever having occurred. (*Vide* Report of Dr. Burland, R. A., Health Officer of the Port of St. George.*)

* In Appendix (F.)

23. A medical question remains to be determined. Could Alton, while suffering from intermittent fever, have contracted yellow fever at Nassau? Could the latter disease remain dormant, in a state of incubation for 16 days, while the intermittent was in force? Medical experience will declare that it is impossible for two distinct fevers to exist in the system at one time, the one lying dormant and the other being in a state of activity. But there is evidence that an intermittent may suddenly change its type to that of yellow fever, when the specific epidemic wave or influence passes over a district. This is by no means uncommon in Jamaica. (*Vide* answers to Question 19 by Mr. Barrow, Deputy Inspector General of Hospitals.†)

† In Appendix (H.)

24. When we examined the house in which Alton died, on the 17th June 1865, Mrs. Walshe related a conversation which she stated she overheard between a man named Shaw and Alton, on Sunday the 19th June 1864. Shaw is reported to have said, "That he had, that day, seen a man buried in the Roman Catholic Cemetery like a dog, wrapped in a blanket, with no one to read the funeral service over him except a dirty fireman."

Alton replied, "That he was sorry for the poor fellow, as he had come out with him in the 'Fannie' from Nassau." Mrs. Walshe also stated that the man Shaw sailed on the 21st June in the "Index" steamer. It is rather extraordinary that Mrs. Walshe never mentioned this conversation before, as her evidence had been taken on several previous occasions. She understood that the fireman dug the grave himself, and got into the cemetery unknown to anybody. There is unfortunately no registration of deaths, and no complete registration of burials in Bermuda at present. It is doubtful, however, if anyone could have been thus secretly buried, especially if dying from yellow fever, as many people at that period were anxiously looking out for cases. On the whole, therefore, we are not inclined to attach importance to a report so vague and inconclusive in connection with the present inquiry.

The next decided case (being the second ascertained beyond a doubt to have occurred) was that of George Williams, who was a passenger in the steamship "City of Petersburg," which vessel sailed from Nassau on the 27th May, bound for Wilmington, a healthy port. The ship arrived at Bermuda on the 10th June, and continued healthy until she sailed again on the 24th June. On that day Williams left the ship and lodged at Jones' house, to the west of the civil prison, in a wretchedly confined situation, about 200 yards south-west of, and below Mrs. Walshe's. It would be difficult to imagine anything much worse, in a sanitary point of view, than the whole condition of this establishment. Williams was attacked on the 10th July, 45 days after leaving Nassau, and died with black vomit and a jaundiced skin on the 17th July. The long period which elapsed after his leaving Nassau seems to show that the fever was contracted in Bermuda. There had been no communication with Alton or with Walshe's family.

26. On the 17th July a sailor was found drunk near the Wesleyan chapel, which is less than a quarter of a mile from Fisher's Wharf, and next day it was discovered that he was dying from yellow fever. Dr. Hunter states that he died with black vomit on the 18th July at Oakley's house. Nothing is known about the history of this man.

27. The disease now showed itself among the troops on the opposite or east side of the town. The first case was that of a Serjeant Cooper of the 39th Regiment, who was living under canvas at the rear of the Royal Barracks. It is believed that he had had no communication with either of the former cases. He was seized on the 16th July, and died on the 22nd with black vomit and a jaundiced skin. The 39th Regiment sailed for England on the 27th July, and no other case appeared in the corps.

28. On the 23rd and 24th July, two men of the 2nd Battalion of the 2nd Regiment, and an artilleryman, were attacked. The former were living under canvas near the Navy Tanks, but had, no doubt, frequently visited the town, and the latter was a hospital orderly who had been living in the temporary Royal Artillery Hospital near Penno's Wharf, and not far from Fisher's Wharf, where

the steamer "Fannie" coaled. No connection has been traced between these cases and the previous ones. The disease, soon after this, became general all over the town.

29. The first case in the left wing of the 2nd Battalion of the 2nd Regiment, stationed at Boaz Island, appeared on the very same day that the first case was noticed in the right wing of that battalion, stationed at St. George's, namely, on the 23rd July, although there had never been any communication between the two wings since their reaching the colony on the 16th of July, except that on the 22nd of July one company had been moved from Boaz Island to St. George's. On the arrival of the transport at Ireland on that day, the men of the left wing were at once encamped at the west end. The right wing was then sent to St. George's in a small steamer. The stations of the two wings were thus removed, the one from the other, the extreme length of the islands.

30. The man first attacked at the west end had been on guard in the dockyard on the 22nd July, and next day was seized with fever. He had had no communication with any fever case. Two other men of the regiment were attacked on the 24th and 26th July respectively; and there is not the least suspicion of contagion attached to any one of these cases. Fever appeared among the dockyard people on the 15th August, on which day a child named Matthew Lynes, who had left St. George's on the 14th, was seized while living on board the "Tenedos" hulk. He died on the 17th August. Two dockyard labourers living in Victoria-row and Portland-square respectively were next attacked on the 17th August, and they both recovered. The men of the Royal Artillery stationed at Ireland Island were not affected until the 25th August, a full month later than the men of the 2nd Queen's. This must be attributed to the fact of their having been more acclimatized than the newly-arrived regiment. About the 24th August fever became intense at Ireland Island, that is to say, about three weeks later than at St. George's; and during the whole of September it showed great malignancy. It would appear to have been more virulent among the troops at this end of the group of islands than the epidemic of 1853. The first person attacked at Hamilton had recently arrived from St. George's. The date of seizure was the 29th July. From this time other cases continued to appear, and by the 13th September, about a fortnight later than at St. George's, the epidemic had reached its height in the town of Hamilton.

TABLE to show the Locality of the earlier Cases.

Parish.	Island.	Date of First Case.	Date of Last Case.	Period of Greatest Intensity.	Remarks.
Hamilton	Main Island	19 June	Uncertain	End of Aug.	The town of Hamilton is not in the parish of the same name, but in Pembroke parish.
St. George's	St. George's	25 „	5 Jan. 1865	Ditto.	
Sandys	Boaz	23 July	22 Oct. 1864	29 Sept.	
Southampton	Main Island	28 „	25 Aug.	21 „	
Pembroke	Main Island	29 „	23 Dec.	13 „	
Smith's	Main Island	3 August	Uncertain	End of Aug.	
Sandys	Somerset Island	5 „	23 Nov.	26 Sept.	
Warwick	Main Island	6 „	25 Sept.	14 and 17 Sept.	
Devonshire	Main Island	13 „	Uncertain	5 Oct.	
Sandys	Ireland Island	16 „	23 Nov.	27 Sept.	
Paget	Main Island	23 „	18 „	10 Aug.	

31. The disease thus appears to have commenced in St. George's on the 25th June, and at least a month passed away before it gained any force. It then travelled somewhat quickly over the islands, proving most malignant in the towns

and dockyard, where there were the most overcrowded and susceptible populations. Most parishes were attacked between the 23rd July and the 6th August. The last case in Ireland Island occurred on the 23rd November, in the town of Hamilton, on the 23rd December, and in St. George's as late as the 5th January 1865.

32. There was a constant intercourse between St. George's and the islands generally, including the town of Hamilton, during the whole epidemic period, on account of the high rate of labour in the former town. It was remarked that in the town of St. George the rate of mortality was unchanged to the end of the epidemic, but among the troops there seemed to be less malignancy in the months of November and December. The last soldier was attacked on the 10th December.

33. No ship is shown to have arrived with a case of yellow fever on board until some time after the disease had appeared at St. George's. The brigantine "Apus," from Nassau, anchored outside the harbour, in "Five Fathoms Hole," on the 29th June. As one passenger had died on the voyage, the vessel was not allowed to enter the port, but was sent to Quarantine Island, in the Great Sound. Her crew and passengers were landed, and the ship was cleansed and fumigated, and no other case appeared. The barque "Mary" anchored at the same place on the 5th July. During her voyage from Nassau one passenger had also died. She was kept in quarantine until she sailed for St. John, New Brunswick, on the 9th July. No case appeared on board during her stay in Bermuda.

34. After the epidemic had acquired full force several steamers arrived, and departed with yellow fever cases on board.

35. The following table possesses interest. By it the comparative severity of the epidemic of 1853, 1856, and 1864 can be estimated :—

RETURN showing the Comparative Sickness and Mortality in Bermuda, in the Epidemics of 1853, 1856, and 1864.

STATIONS.	Strength, including Officers, Women, and Children.	Attacked.	Died.	Ratio of Deaths to every 1,000 of Strength.	REMARKS.
1853 Population of Bermuda, including troops, civilians, and convicts.	14,387	–	*663	46·08	* Of the 663 deaths 161 were convicts and guards, their strength being 1,778.
1856 - - Ditto - - -	13,848	1,367	129	9·31	
1864 Population, including troops, people in dockyard, but no convicts.	13,536	4,008	471	34·79	
1853 Civil population of Bermuda, Census of 1851.	11,092	–	138	12·43	The mortality was greatly increased by the great influx of sailors in 1864.
1856 - - Ditto - - -	11,092	1,084	88	7·93	
1864 Ditto, Census of 1861 - -	11,450	3,148	237	20·69	
1853 Troops at all stations - -	1,517	832	361	237·96	* *Vide* remark at the bottom of this column.
1856 - - Ditto - - -	1,326	44	4	3·09	
1864 - - Ditto - - -	1,460	*640	*206	*141·09	
1853 Troops in Royal Barracks, St. George's, and Ferry Point.	339	283	114	336·28	These figures are not of much value, as it is impossible to distinguish the mortality at St. George from that at Ferry Point, the men were changed so constantly.
1856 - - - - - -	894	3	–	–	
1864 Ditto of 2/2nd Regiment only, at St. George's and Ferry Point.	417	204	85	203·83	
1853 Troops at Ireland and Boaz Island.	442	69	27	61·08	* The admissions and deaths would have been far more numerous had the troops not been sent to Halifax in September 1864.
1856 - - - - - -	331	27	1	3·02	
1864 - - Ditto - - -	596	*160	*49	*82·21	

36. If the 161 deaths among convicts, in 1853, were added to the deaths, during the epidemic of 1864, the total mortality would not vary greatly. As regards the troops the total mortality is much less than in 1853, but it must be remembered that in 1864 the troops were quickly moved out of barracks and encamped, and a large number were also sent to Halifax in September. If we look at the mortality among the civil population, it is shown that about 100 more deaths occurred in 1864 than in 1853; but the number of sailors in the island, during the last epidemic, was greatly in excess of that in 1853. A good criterion of the actual mortality among the troops in St. George's, in 1864, will be arrived at by examining the history of 143 men of the 2nd Battalion of the 2nd Regiment, who remained there, or were sent in, on "fatigue duty" from Ferry's Point. Of these 143 men 103 got fever, and 55 died, or 384·61 per 1,000 of strength. This is a high rate of mortality, and probably as high as that among the troops in St. George's, in 1853. At Ireland Island the mortality was far greater than in 1853. The deduction, therefore, must be, that the epidemic of 1864 was as severe as that of 1853, but that the mortality among the troops fell far short, owing partly to the greater promptitude in encamping them, but principally to the removal of so many to Halifax.

37. We proceed to report upon the circumstances which appear likely to have exercised a prejudicial effect on the health of the troops. Although it is impossible to determine to what extent the defective sanitary condition of the town of St. George's, previous to the outbreak, influenced the general health of the troops in the vicinity, we are unable to dispel the strong impression that to some extent it did so. We are borne out in this opinion by the facts that, on the one hand, unacclimatized persons living in the neighbourhood were almost universally attacked, although they never entered the town, and, on the other, those who were removed in time escaped attacks to a very great extent.

38. The 2nd Battalion of the 2nd Queen's Regiment was encamped directly it disembarked. The only corps occupying barracks, and whose health could have been affected by sanitary defects in the buildings, were the Royal Artillery and Royal Engineers, and they were quartered as follows:

Station.	Corps.	Barracks.	Cubic Feet per Man.
St. George's	Royal Artillery	Fort Victoria	600
		Fort Catherine	1,474
		Fort George	708
		Fort Cunningham	517
	Royal Engineers	Old Sappers Barracks	748
		Fort Albert	751
Ireland Island	Ditto	Casemate Barracks	598
	Royal Artillery	Ditto	598

39. The average cubic space per man here indicated is greater than the ordinary average, because in the summer months it is always the custom to encamp a portion of the troops. In winter the space does not average more than 512 cubic feet each man. The ventilation in the casemated forts is, from their construction, necessarily very imperfect. This is especially the case in the lower rooms, where fresh air can only enter at the windows and inner doors, if at all. The foul atmosphere, we observed, passes up the staircases, from the lower rooms to the upper. On testing, at midnight, the temperature of one of the upper rooms of Fort Victoria, in which six men were sleeping, the thermometer reached 77°, which was only one degree higher than in the Observatory. The same night, at 11.30 P.M., the thermometer in one of the rooms of the Royal

Barracks, occupied by 22 men, reached 83° 7, or 7° 7′ hotter than at the same hour in the Observatory. The atmosphere was very foul, although the windows were open; the situation itself was elevated, and there were ventilating outlets in the roof. The defective state of ventilation in barracks and guard rooms will be referred to at the end of this report.

40. The general condition of the drainage, latrines, and urinals, at the military stations, may be broadly stated to have been very indifferent, both from the position of those works, and from their faulty construction; but no greater nuisance than usual was observed from these sources.

41. The water supply at each barrack would be sufficient under ordinary circumstances for drinking and cooking purposes, but not if baths were furnished to the men, nor if it be largely made use of for washing linen, &c. Rain water is collected from the roofs of the barracks and redoubts, and from the smooth slopes of rocky hills, and it is then stored in underground tanks in the manner we have before described. The water is of very good quality generally, and it is not stated in any instance that the health of the troops was injuriously affected by unwholesome water. It is found that, on the average, every individual consumed or used about five gallons of water daily. In very dry seasons the water has been known to fail in the tanks at all the barracks, except in that outside Fort Victoria and the Garden Tank, in rear of the Royal Barracks. When the supply has failed, water has had to be brought from reserve tanks, at greater or less distances from the barracks. Additional water supply is required at the different camp grounds.

42. There is no evidence that intemperance prevailed to a greater extent than usual among the troops. Previous to the epidemic, spirituous drinks were no doubt too freely indulged in; but it must be stated that malt liquors could rarely be obtained at a cost commensurate with the limited pay of a private soldier. During the epidemic it would appear that fear caused many men to drink a larger quantity of spirituous liquors than they were accustomed to. We append a table throwing some light on this subject, and on which very great care has been bestowed by officers commanding corps. The numbers are sufficiently large to afford evidence of value.

It is stated to have been the opinion of medical officers and others, that habitually intemperate men escape disease of this class in a larger proportion than temperate.

The following return may prove to be of interest, if not of positive value, in connection with this point.

Bermuda.—Epidemic of 1864.

Return showing the relative Number of Attacks of Yellow Fever, and Deaths from that Disease, among Temperate and Intemperate Men of Her Majesty's Troops on the Station.

CORPS.	Temperate Men.		Occasional Drunkards.		Habitual Drunkards, and men known to be Habitual Hard Drinkers		Totals.	
Royal Artillery. Royal Engineers. 2nd Battalion of 2nd Regiment.	Number.	Ratio of Attacks and Deaths to 1,000 of Strength.	Number.	Ratio of Attacks and Deaths to 1,000 of Strength.	Number.	Ratio of Attacks and Deaths to 1,000 of Strength.	Number.	Ratio of Attacks and Deaths to 1,000 of Strength.
Number of each Class -	735	- -	215	- -	188	- -	1,138	—
Number of Attacks -	355	482·99	73	339·53	50	267·02	478	420·03
Number of Deaths -	111	151·02	39	181·39	19	101·06	169	148·50

Only 10 per cent. of the men reputed to be intemperate died, and 15 per cent. of those reputed temperate. Twenty-six per cent. of the men classed as intemperate were attacked, and 40 per cent. of those reported temperate. The occasional drunkards, however, suffered the greatest mortality, 18 per cent. of that class having died.

43. It was discovered, during the earlier period of the outbreak, that attacks of fever among Her Majesty's troops were increased in two instances by the nature of the military duties. Measures were accordingly taken to remedy the evil, and the result was satisfactory. This was particularly the case in the following instances.

When the troops were removed from the vicinity of the town of St. George, it was unfortunately not foreseen that it was necessary that the head quarters, the sick, the civil departments, and the commissariat stores should be removed at the same time. This course not having been taken, it became necessary to send back men from the distant camp on numerous duties of fatigue. Thirty-eight per cent. of these men died. Subsequently, when coloured labourers were obtained, and there was no further occasion to employ the troops on these duties, the mortality from this cause ceased.

Again, at the west end of the islands, a guard was furnished for Her Majesty's naval yard, where there were stores of great value from the camp at Boaz Island. The naval superintendent in charge was unwilling to incur the responsibility of dispensing with this guard, although officially requested so to do. As the dockyard guard had occasioned some loss of life in 1853, it would have been more prudent, after the experience of that year, to have discontinued it during the recent epidemic, which was not, however, effected until the 1st of October, when, after having been gradually reduced, it was wholly withdrawn.

It is advisable that special instructions should be sent out to provide against the recurrence of similar circumstances hereafter.

44. The hospital accommodation was not nearly sufficient at St. George's when the sick began to be numerous, as was the case in August, and during the first half of September.

On the 2nd September, there were 78 or 79 patients crowded into the wards and verandahs of the military hospital, which was constructed for 48 sick. But at 1,500 cubic feet of space per man, the building was not, in fact, capable of accommodating more than 24 sick.

Seventy men were lodged inside the wards, which allowed only about 500 cubic feet of space per man.

In the month of May, before the appearance of the epidemic, we find that each sick man had an average of 6,000 cubic feet in the military hospital, there being then only five sick, and of 1,200 cubic feet in the Royal Artillery Temporary Hospital in the town of St. George.

The state of ventilation of the wards in the military hospital is good. There are proper inlets and shafts, windows of sufficient size, and fire-places. The water-closets are placed at either flank of the building, and are outside the walls, and the contents pass into a sewer, running into the sea. Water is kept in tanks above the closets, to which it is lifted from the underground tanks by a force-pump. Rain water is too valuable, and should not be used for this purpose. Salt water could easily be raised by windmill power, and would answer equally well; the sewers could then be more effectually flushed. The supply of rain water is not sufficient in dry seasons, or when there are many sick requiring warm baths, as during the late epidemic, when it had to be brought from a distance, at great inconvenience and expense.

45. Several excellent measures were adopted soon after the appearance of the earlier cases of fever.

The day after the death of the first soldier the head quarters of the 39th Regiment marched out of the Royal Barracks, St. George's, to Ferry Point, where they were encamped. This was on the 23rd July. The 2nd Battalion of the 2nd Regiment never, until the disappearance of the epidemic, occupied any barracks, but was placed under canvas on disembarkation, the left wing at Boaz Island and the head quarters at the Navy Tanks, about half a mile from the town of St. George. It was unfortunately considered that this latter position was sufficiently distant from the town, and that it would prove healthy. Five days after the 39th Regiment sailed for England the right wing shifted their camp to Ferry Point, their strength being 10 officers and 276 men, while the strength of the left wing, encamped at Boaz Island, was 10 officers and 379 men. Eighty-two men of the Royal Artillery moved out of Fort Victoria, near St. George's, on the 18th July, and were encamped on the glacis, which was too near the town. They were not shifted to the glacis of Fort Cunningham until the 15th, 16th and 17th August, on account of all the medical officers having contracted fever. One hundred and nineteen men of the Royal Engineers were also encamped outside their barracks on the 18th July. Two officers and 76 men of this corps marched to the camp on the glacis of Fort Cunningham on the same day as the Artillery.

This fort lies about 1¼ mile south-east of St. George's. One officer and 80 men of the Royal Artillery moved out of the Casemate Barracks at Ireland Island on the 25th August, and were encamped on the glacis.

46. Bell tents of double canvas were issued to the men at all the camps; they had small ventilating apertures in the canvas near the top of the pole. Three men lived in one tent: each man under canvas had therefore 171 cubic feet of space, estimating the cubic contents of a tent at 513 feet.

Every man had an iron bedstead and a horse-hair pillow and mattress.

47. On the 2nd August seven sick men of the Royal Artillery and Engineers from the temporary hospital St. George's were treated in marquees pitched near the military hospital, but these were not fever cases. On the 18th August some few convalescents of the Artillery, Engineers, and 2nd Battalion of the 2nd Regiment were removed from the hospital building, and treated in marquees pitched on the glacis of Fort Victoria. On the 26th August, and during the following week several additional marquees were pitched near the hospital, and convalescents from fever were treated in them.

On the 27th August there were about 40 convalescents in these marquees, seven men being placed in each tent. In this way the overcrowded hospital was by degrees effectually relieved. The whole of the sick at the camp at Ferry Point were treated in marquees, and the acute fever cases appeared to progress very favourably. The proportion of mortality to cases was at the rate of 278·68 per 1,000 only, while at St. George's in the hospital building it was 473·28 per 1,000 among the men of the same regiment. This is, however, no fair criterion, as a milder description of fever was contracted at Ferry Point, and at this camp the sick were also breathing a comparatively pure atmosphere. The evidence submitted to us does not decide the question whether it is preferable to treat fever cases in tents, or in a properly constructed and well situated hospital building. An opinion has been offered by Mr. Barrow that the building would be preferable.

48. The effect of encamping the troops was very good, and would have been still more satisfactory but for the necessity of sending the men back in small detachments, to do duty in the most dangerous localities until a sufficient supply of coloured people was obtained to relieve them of that labour. It would appear that every man who died at Ferry Point camp contracted the fever while on duty at St. George's. Not one man died who never left the camp, and the only officer who died there had frequently been in St. George's. The bandsmen, who were strictly confined to the camp, did not lose one of their number.

Exactly the same routine was carried out at Boaz, where men were sent away from the camp for duty in the most unwholesome locality of the dockyard. The men of the Royal Artillery and Engineers had been kept so long encamped in the vicinity of St. George's, that the good effect of moving them to the camp at Fort Cunningham was scarcely observable. In fact, for the first 17 days after shifting their ground there were very many admissions into hospital. The cases then rapidly decreased in number.

49. Eight officers and 201 non-commissioned officers, rank and file of the 2nd Battalion of the 2nd Regiment, sailed from Boaz Island for Halifax on the 9th September 1864, in Her Majesty's steam frigate "Galatea," and on the 24th September a second detachment of one officer and 51 men of the same regiment, two officers and 70 men of the Royal Artillery, and one officer and 67 men of the Royal Engineers also sailed for Halifax in the same ship. Four cases of fever appeared among the troops either on the voyage to or at Halifax, and three of them ended fatally. The disease then entirely ceased. After the second detachment left Bermuda, the remaining men who had not contracted fever were concentrated at the camp at Ferry Point. It was not found necessary to remove

them to Halifax, as cases almost entirely ceased to appear, although there were many seen for more than a month later at Ireland Island, and for two months later in the town of St. George.

The measure of removing so many of the troops to Halifax saved a large number of lives, and should be always adopted without any delay in the event of future epidemics. It is the only effectual and certain remedy, for it must be remembered that there are no mountainous districts in Bermuda, where land can be found at such an elevation above the sea as to render immunity from the disease probable.*

50. Before the troops returned to their barracks or to the redoubts every precaution was taken to place the various buildings in as good a sanitary condition as circumstances would admit of. They were thoroughly cleansed, fumigated, and limewashed, drains and privies were flushed frequently and sprinkled with quicklime. Ash-pits were kept well cleared out; the bedding was frequently aired. Great attention was paid to the sanitary state of the military hospital; ceilings and walls were scraped and limewashed, the woodwork was fresh painted, and, in fact, everything was done which was considered necessary for the health of the inmates.

51. The civil authorities of St. George's showed much energy shortly after the outbreak of the epidemic, however unprepared they may have been to meet the approach of the pestilence. The family of the Walshes (among whom the first case appeared), was encamped and placed in strict quarantine. All houses where fever had appeared were well fumigated and whitewashed. Old hulks were removed from the vicinity of the town and moored near St. David's Island. Ships were ordered to anchor out in the stream, and the captains requested to enforce cleanliness on board. Ships containing fever cases were placed in quarantine at Darrell's Island, near Port's Island. Slaughter-houses were removed from the town of St. George. Nor were the Colonial authorities less alive to the emergency. Three fever hospitals were opened by the Colonial Government; one at Pendle Hill, a mile and a-half south-west of St. George's; a second at Devonshire College, in the neighbourhood of the town of Hamilton, and the third at Church Hill, Somerset. These hospitals proved to be of great service. A new Public Health Act came into operation on the 25th August 1864. It gave additional powers to Boards of Health, and contained proper regulations respecting burials in cemeteries, slaughter-houses, manufactories, infected vessels, the removal of nuisances, and the cleansing of houses. It limited the number of inmates to be taken into lodging-houses, so as to allow 400 cubic feet of space to each lodger. Every Board of Health was empowered to appoint an inspector of nuisances, though the only Board which availed itself of such power seems to have been that of the town of St. George. It is necessary that others should also be appointed, both for the town of Hamilton and the country districts. If the new Act is stringently carried out it must prove of benefit.

52. At present there is a central Board of Health, composed of the Governor and Council. It would be better to alter the composition of this Board, which should comprise at least two or three experienced medical practitioners. Men of position should be selected who possess some knowledge of sanitary science, and they should be a paid and responsible body.

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* The undersigned wishes to be understood as not concurring in this recommendation, as it appears to him that no sufficient evidence is produced to show that these Islands do not contain within themselves abundant sanitary resources for all practical purposes, if the same be promptly and fairly employed. Isolation and dispersion of troops are perfectly obtainable in Bermuda itself; and if the various camping grounds were habitually kept in a state fit for use on emergency, and proper regulations with regard to Her Majesty's troops to save them from exposure, fatigue, and contact with infected districts were at hand to be immediately enforced on the first indication of epidemic disease, and were promptly and firmly carried out, the results would probably be little, if at all, less satisfactory than those derived in 1864, from sending the troops to sea. This seems to be borne out by the statement of this report, that cases among the troops left behind at Ferry Point almost ceased to appear after the second detachment had left for Halifax, although at Ireland Island and at St. George's itself the disease was rife for several weeks later; at least it seems to be worth while before resolving on denuding the colony of its garrison to try the effect of a more complete dispersion and prompter separation of sick from well than has yet been attempted.

S. Brownlow Gray.

53. The value of a proper application of sanitary laws was made very evident at Hamilton in September 1864, at which period fever was raging with great virulence. The "Melita," Captain Higginson, a British steamship, of 853 tons, with 55 people on board, arrived off St. George's, Bermuda, on the 23rd August, and proceeded to Hamilton on the 12th September, where she was hauled alongside a wharf, in which position she remained until the 3rd October, a period of 21 days, without a case of fever appearing in the ship.

The Honourable Mr. Tucker, Mayor of Hamilton, thus describes the precautions taken by the Captain of the "Melita": "'Total abstinence' on the part of the captain and crew, and no liberty allowed on shore. The vessel was fully 'awned,' decks washed twice a-day, cabins and forecastle cleaned daily, the latter being whitewashed twice a-week, and the bedding aired fore and aft. The holds, fore and aft, and the engine-room were several times whitewashed; the bilge water was constantly cleared out; chloride of lime was sprinkled daily over the whole ship. The crew had fresh provisions for the whole period, and an arrangement was made to enable them to get salt-water baths on board ship."

54. Many sanitary improvements are essentially necessary in Bermuda, both in the town and country districts, before exemption from periodical epidemic visitations can be reasonably expected.

55. We cannot too strongly urge the immediate construction of a proper system of sewers in the towns of St. George and Hamilton, and no time should be lost in maturing the plans. Sea water in any quantity can be raised by steam-power for the purposes of flushing. We are not prepared to determine the best situation for the escape of the sewage matter into the sea. The advice of a competent engineer should be taken on this point. The sewage should be conducted to some distance from the towns, and allowed to escape in such a position as would ensure its being rapidly carried out to sea.

56. The streets of St. George's are at the present moment being widened. This is most essential. It is important that several open spaces should be left between the houses, so as to allow the south wind to enter the town. This is requisite because the two main streets run somewhat parallel from east to west.

57. The ground floors of all new dwelling houses should be raised some feet above the level of the streets or roads. The ceilings should be of good height, and the windows of large size, reaching nearly up to the ceiling. All sinks should be trapped, and no openings leading into drains should be permitted inside dwelling houses. It is greatly the custom in Bermuda to plant thick hedges of oleander and other trees around houses, which effectually exclude the refreshing breeze. Very often high walls are seen to enclose the hedges. It would tend to promote health if walls and hedges were never permitted to exist close to dwelling houses. A light railing might be substituted with great advantage.

58. A good supply of wholesome water is of the greatest importance throughout the islands, but especially in the towns. No new house should be built without proper rain water tanks being provided; and care should be taken that they are not situated near privies or sewers. Rain water might also be collected from all public buildings, and stored for the benefit of the poorer classes. All tanks should be well cleaned out once a-year, and the "catches" kept clean and whitewashed. A constant inspection of cellars, outbuildings, tanks, dust heaps, privies, drains, and sewers, should be made throughout the year, and not be delayed until the pestilence bursts out in all its fury.

59. We are of opinion that large portions of both the Devonshire and Pembroke Marshes can be reclaimed. If systematically drained the land could then be brought into profitable cultivation. There is no probability, however, that the owners of the marsh lands will undertake this measure, which would involve the outlay of a large amount of capital. It is, therefore, advisable that the Government take the matter into its own hands, and purchase these marshes. Such portions of them as can be reclaimed might be drained and cultivated, or afterwards resold at a profit.

A stagnant pond, but which is slightly affected by the tides, exists at the base of Fort Cunningham. A cut was made nearly 35 years ago from this pond leading to the sea. Is is now choked up, but could be re-opened at a small expense, and the sea freely admitted. During the epidemic of 1853, the first case of yellow fever appeared in this locality.

60. In the neighbourhood of the town of Hamilton some land might be reclaimed at the end of Crow-lane Harbour, if a sea-wall were constructed across the inlet. By this means the offensive exhalations which proceed from the mud deposited or uncovered at low tide would be prevented.

61. Every year before the hot weather sets in, the heads of creeks should be cleared of any accumulation of seaweed. All rank vegetation should also be got rid of. Bermudians, it must be admitted, are somewhat behind the age as regards their knowledge and appreciation of sanitary science. If they were to devote serious attention and some money to the effectual enforcement of hygienic measures, these epidemic outbreaks, so costly, as well as so distressing, of late years, may probably be either altogether warded off, or greatly mitigated. It must be remembered that not yellow fever only may thus be to a certain extent successfully combated. All diseases of the zymotic class run riot in localities where sanitary laws are neglected.

62. We next proceed to make some recommendations having reference especially to the safety and health of the troops in the command.

63. On account of the more frequent visitations of yellow fever of late years, we recommend that the same principles be made to apply to these islands as to the West Indies.

The strength of the white troops should therefore be reduced to a minimum compatible with the safety of the islands, and a proportion of coloured troops introduced. Had coloured troops formed a portion of the garrison at the commencement of the late epidemic outbreak, the lives of many valuable soldiers would have been saved; for the coloured troops could have performed, with comparative safety to themselves, all the "fatigue duties" which were indirectly the probable cause of the death of so many European soldiers.*

64. There is not nearly sufficient barrack accommodation for the troops. We understand that wooden barracks are about to be constructed on Prospect Hill. The situation, in our opinion, is good. In this climate wooden huts are required to be made more lofty than in England. Larger windows are also necessary, and ridge-ventilation should be carried out through the entire length of the roof. Fire-places and chimneys are very useful, both for ventilation and drying the rooms, in damp weather. Every man should have at least 750 cubic feet of space, and a superficial area of 50 feet. The huts should be raised from the ground on stone footings, and should be surrounded by a broad, lofty, and nearly horizontal verandah. They should extend in a line from east to west as nearly as possible.

65. If coloured troops are introduced it will be advisable to concentrate them at St. George's, so as to keep as few white soldiers as possible in the vicinity of that town.

66. The Royal Barracks are too closely surrounded with outbuildings, which cause a great stagnation of air. Several of these outbuildings are too small, and should be pulled down, and more suitable buildings erected in more open localities. The canteen, orderly-room, and barrack-office, and stables to the east, and a few married men's quarters, the bakery, and the sergeants' mess to the

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* The undersigned, while fully allowing that the liability of the white troops in garrison to yellow fever attacks would be diminished by employing the services on "fatigue duties" of coloured troops, whose constitutions seem to render them impervious almost to the poison of this fatal disease, sees no reason to doubt that these islands may, under proper sanitary regulations, prove as healthy a station for European troops, taking one year with another, as any other military station under the British flag.

S. Brownlow Gray.

west of the barracks, should be pulled down and rebuilt in a more open situation. These outbuildings, moreover, are all on too small a scale. Three cottages are situated very near the officers' privy; scarcely any current of air can reach them, and they have proved so unhealthy during the late epidemic that they had better be pulled down.

There was a great mortality in the two upper cottages during the epidemic of 1853. The regimental recreation room is very small, hot, and uncomfortable; a new one is greatly required. The regimental cells are placed very badly, and must prove unhealthy; they should be rebuilt on a better site. The strong-room, under the guard-room, is more like a cellar than anything else. In wet weather it is flooded by the rain. The guard-room requires ridge-ventilation.

67. The want of sufficient quarters for married men extends to every corps of the garrison, and is not confined to the Royal Barracks. It is in every respect one deserving the most serious attention of the military authorities.

68. The Royal Barracks are found to be hot in summer. They are scarcely raised above the level of the ground, and, consequently, the temperature is increased considerably by the reflected heat. The state of ventilation is defective. Free ridge-ventilation is required along the entire length of the roof. The windows are too small; they should be carried up to the roof. More under-floor ventilation is also required. These barracks would be greatly improved if the roof, both of the main building and of the verandah, could be heightened four feet.

69. The line officers' quarters proved very unhealthy in 1864, and it will be remembered, that, in 1853, the mortality was exceedingly great in the entire range of the buildings. It would be better to pull down these quarters and rebuild them on a more modern plan, abolishing altogether the underground kitchens and other offices. They can, to a certain extent, be improved by throwing a front and back room into one quarter, and folding doors might be furnished, reaching to within three feet of the ceilings. By this contrivance, a thorough draft of air could be obtained. The ceilings and windows could be heightened more than a foot. Larger air outlets are necessary. More officers' quarters (especially field officers) are required. The boundary wall in front keeps out much air. It might with advantage be replaced by an open iron railing. The ground to the south-west and opposite the quarters should be lowered at least two feet, and such portions of the trees as overhang the roof should be lopped away.

70. The military hospital requires to be enlarged, but not to any considerable extent. If coloured troops are kept at St. George's, two small wings added to the present building would be sufficient. The out-offices are too small and too few in number. Additional store-room is necessary. The system of keeping purveyors' or other stores under the hospital is highly objectionable in this climate, and should be discontinued. A more thorough circulation of air through the basement story would be advisable.

71. The military prison is in a close confined situation. Trees, walls, and various buildings surround it, and exclude the air. An upper story is being added on the east side, which will still further add to the closeness within the building. If a large number of apertures were made through the walls six feet from the ground, ventilation would be a little improved, but discipline might possibly be impaired.

72. The town main-guard is in a hot unwholesome situation, and the building is wretchedly ventilated. It would be better to enlarge the guard-room on Ordnance Island, which is not 100 yards distant. Both guard-rooms can scarcely be required. A commodious wooden hut might be built midway between forts Victoria and Albert, sufficiently large for a canteen and recreation-room. At present, the recreation-room for the Royal Artillery is in Fort Victoria. It is a dark gloomy room in the casemates. The canteen is in Fort Albert, and the room is very small, uncomfortable, and inconvenient.

72*a*. The redoubts around St. George's should not, if it can be avoided, be occupied by the troops during peace time. There is no proper circulation of air through the rooms, and, from the nature and construction of the buildings, this can scarcely be remedied. Wooden huts might be erected outside the redoubts at a convenient distance for a small number of men. Under no circumstances should the lower rooms of the redoubts be occupied, except in time of war.

73. The main guard-room in the dockyard at Ireland Island ought to be pulled down and rebuilt on higher ground on the opposite side of the entrance road. The present site is very low and generally defective, and scarcely any air can circulate through the building. The married men's quarters at Ireland Island require additional ventilation.

74. Additional tanks should be provided at Ferry Point and Fort Cunningham. as well as at the military hospital. If a large one were constructed at Gibbs Hill, it would prove useful in the event of a camp being formed in that elevated and airy locality. Tanks should be removed wherever they exist under barracks or quarters. During the last epidemic, great sickness and mortality were met with in several military quarters under which there were tanks. During the 1853 epidemic, the mortality was great in the same quarters. Wherever leaves of trees are likely to lodge on the roofs of military buildings, coarse wire strainers (placed at the entrance of the escape pipes) would prove useful. Rain water might be caught from the parapets of the redoubts, and stored in separate tanks for washing purposes; but this water should never be made use of for drinking and cooking, as is done at the western redoubt. It is very liable to become contaminated in various ways. We observe that baths are not provided for the troops at any of the barracks. One bath should be furnished for every 100 men.

75. The new drainage scheme, which has already been sanctioned for the station of St. George's, should be carried into operation as quickly as possible; when completed all cesspits will be abolished, and the sewers will be flushed daily with salt water, raised by steam power. Either Jennings's or M'Farlane's privies should be generally introduced. They can easily be flushed from tanks.

76. The monotony of life in Bermuda is very wearisome to the soldier, and tends to debauchery and other irregularities, which again bring him into contact with many conditions highly detrimental to health. Games of the greatest possible variety should therefore be provided, and books of a lighter and more attractive character than those in the garrison library might with advantage be furnished at this station.

77. As Ferry Point has proved, on more than one occasion, to be a very healthy locality for an encampment, it would be as well, in the event of a future epidemic, to quickly remove troops to that spot in preference to any other camp ground. A few wooden buildings would be required in the neighbourhood, although not actually on the camp ground, such as a small temporary hospital, commissariat and purveyor's store-rooms and offices, a bakery, &c. They might be erected on the higher ground to the north of the Peninsula.

78. It would be desirable that a man-of-war, or troop-ship, should, if possible; remain off Ireland Island during the months of June, July, and August in each year, this being the period when an epidemic outbreak may be expected.

79. Drafts for corps and reliefs for regiments should depart from England or elsewhere at such a period as to arrive in Bermuda during the month of November; it would then be known at home if these islands were in a healthy state and free from epidemics. The troops also would have the cold season before them, and become somewhat acclimatised, before the approach of the next period of danger.

80. We are of opinion that it would be of great advantage if a code of regulations were drawn up, defining the exact mode of procedure during epidemic seasons. The regulations might be so framed by the proper military authorities in England as not only to relieve individuals from responsibility, but to ensure the adoption of the wisest and safest measures during the emergency. When great danger suddenly bursts upon us, a state of panic and confusion is apt to

prevail, and individual judgment is likely to be overawed. At such a time the value of a well-organised system cannot be over estimated.

S. Brownlow Gray,
Attorney General.
T. W. Barrow,
Deputy Inspector General of Hospitals.
Francis Cogan,
Surgeon Major 2nd Battalion, 2nd Regiment.
Park Benjamin Tucker, M.D.
J. E. Hope,
Brigade Major, R.A.
D. C. Walker,
Captain, Royal Engineers.

P. S.—Since this Report was written a circumstance has been reported to us, on very reliable authority, which throws an important light on the length of time yellow fever may lie dormant, or at least unobserved, in the system, before developing its distinctive features. A young man, named Charles Lockwood, a native of Turk's Island, serving on board the brigantine "Penguin," of Bermuda, arrived in that vessel at Halifax, in the early part of October 1864, from these islands, where the fever was prevalent when he left; he had not been ashore for two days before the "Penguin" quitted Bermuda, as the vessel was at anchor in the Great Sound. On the 8th October, 13 days after leaving Bermuda, and 15 days after being ashore here, he showed the undoubted symptoms of yellow fever, and, after having had black vomit, he died on the 11th October in the public hospital at Halifax. There was no other case of fever on board the "Penguin."

It is obvious that this case is one having an important bearing on some of the most doubtful points connected with the propagation of this disease, and as such we have deemed it of sufficient consequence to be specially noted in our Report.

At least it must be allowed that the development of a case of yellow fever in a climate enjoying a complete immunity from that disease, after lying dormant for 15 days is a circumstance of considerable interest.

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F. Cogan, Surgeon Major,
2nd Battalion, 2nd Regiment.
Park B. Tucker, M.D.
J. E. Hope,
Brigade Major, R.A.
D. C. Walker,
Captain, Royal Engineers.

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19. Frederic J. Brice, Esq., M.D., Assistant Surgeon, R.N.
20. Captain Pullen, R.N. - - - - - - -
21. James H. Thies, Esq., Mayor of St. George's -
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APPENDIX.

(A.)

DESCRIPTION of the Symptoms, &c., of the YELLOW FEVER, as it appeared during the Epidemic of 1864.

SPECIFIC yellow fever, one of the most deadly of the zymotic class of disease, is found only within certain geographical limits, extending from 45° to 48° north, to about 20° south latitude. It is rarely seen far removed from the sea coast, requires a temperature of nearly 80°, and is thus a disease of hot weather. It is seldom found at an elevation of 2,500 feet above the level of the sea. There is much mystery respecting the origin of this disease, some believing that a specific poison is generated by a combination of terrestrial and atmospheric conditions; others that a specific contagious virus enters the blood, gaining in force by its passage through the system, and which is then capable of reproducing the disease. Some physicians consider that ordinary bilious remittent fevers, when influenced by an epidemic constitution of the atmosphere, may, in certain geographical positions, become aggravated or intensified, and change their type to the continued form, with the specific characteristics of yellow fever. But few deny that the disease is materially affected by atmospheric phenomena, and it is generally conceded that an epidemic outbreak prefers localities in the most defective sanitary state, and where there is most filth and the greatest overcrowding. The disease, during the late epidemic, presented very much the same symptoms as in the epidemic of 1853, and assumed different types. In some instances it presented the appearance of the mildest form of simple continued fever or "Febricula," ranging from this to the malignant typhus or purpuric type, when appalling hœmorrhages prognosticate death. The symptoms varied also according to individual temperament; gastric derangement nearly always preceded the attack; diarrhœa was by no means uncommon. The seizure was usually ushered in by chills, or occasionally by actual rigors, which lasted from one to 12 hours, and were followed by continued fever, with a hot skin; the heat being of a pungent or burning nature, the temperature ranging from 100° to 103°. There was a full quick pulse of from 90 to 120 beats in a minute, the eyes were red, brilliant and watery; the term "ferrety" is sometimes made use of to express the appearance; severe headache, concentrating itself in the eyeballs, torturing pain in the loins, thighs, and knees, a white and pasty tongue indented by the teeth, almost always presenting a vermillion appearance of the edges and beneath; the lips and mucous lining of the cheeks and throat were also of the same bright colour; deglutition was often painful. The skin soon began to act freely, often very profusely; nausea and bilious vomiting set in early, accompanied with a burning pain and great oppression at the prœcordia; the bowels during the hot stage were usually costive; medicine produced at first bilious stools, which by degrees became lighter coloured, often of a whitish clay colour. In some cases the stools were dark, thin, and watery from the first, and by degrees became bloody (a dangerous symptom indeed), or they might appear slimy or gelatinous. The urine, in the hot stage, was either unaltered in colour and quantity, or was of a dark reddish brown colour and scanty. There was great restlessness, and, in the severe cases, jactitation; sighs and moans, a strong disposition to get out of bed, a feeling of anxiety or general apathy, wakefulness, stupor, or delirium, were common symptoms. The stage of febrile reaction continued from a few hours to three days, when the fever subsided, and there was a very great amelioration of all the symptoms. The skin now became cool and natural, the pulse dropped to 70 or 80, the mind was calm, and there was an absence of pain. The patient might be cheerful and inclined to sit up, or even get out of bed, and the appetite return. If this amendment took place as late as the third day, there was generally a yellow tinge of the conjunctivæ, the skin might also at this period become yellow. The urine now was always more or less loaded with albumen, which became evident on testing it with heat or nitric acid, and there was a general deficiency of the chlorides. The patient from this period often perfectly recovered, but with a very slow convalescence. But how frequently this period of remission and hopefulness was but a false delusion! The epigastric tenderness might increase and vomiting be re-established; at first the matter ejected would consist of only the drinks, but with a brownish flocculent matter like snuff floating about in it; the tongue would become furred or loaded, especially in the centre, or it might present a raw glazed appearance from being denuded of epithelium; the pulse was either slower than natural, irregular and feeble, or quick and feeble, although the heart appeared to beat with energy. Without any warning the patient might suddenly turn his head, eject copious inky "black vomit," and die in a few minutes; or suppression of urine might take place, and the patient gradually fall into a state of delirium and stupor, ending in coma and death; suppression of urine was quite as dangerous a symptom as the appearance of black vomit. Even in some of the apparently very mild cases, and where the patient considered he was progressing most favourably, black vomit would suddenly appear and death supervene; prognosis was, therefore, most treacherous. In the hœmorrhagic type, there was often a strong congestive tendency from the commencement of the attack with great prostration of the vital powers; the face would be purplish and the eyes look dull, though injected; there would be drowsiness, stupor, a desire to be left alone, general restlessness, frequent sighing, the skin perhaps cool, covered with an unctuous perspiration, and showing, on pressure, a deficiency of the capillary circulation, the pulse slow or weak or accelerated and small; the stools scanty, cream-coloured or gelatinous or "tarry;" tongue tremulous, at first white, but soon becoming dark, especially along the centre; an oozing of black thin blood would take place from the nostrils, gums, ears, or eyelids, and even from the anus, followed by black vomit and death. The intellect as a rule remained clear where there was black vomit, and the reverse where there was suppression of urine. A peculiar odour of the skin was frequently perceived, and is probably owing to the elimination of ammonia from the system, the urea in the blood being thus converted by "metamorphoses," as it is called. Several recovered after ejecting mere traces of black vomit, but not one when the fluid was brought up in any large quantity. Although yellowness of the skin might not be seen during life, it was nearly always evident after death. In malignant cases of the typhus variety, long shreds of mucous epithelium were either vomited or passed by stool. Although black vomit might not be seen during life, it was sometimes found in the stomach and intestines after death; it was ejected from the stomach in about two-thirds of the fatal cases. Five and a-half per cent. of the men attacked suffered from relapses, which, in almost every case, were brought on by imprudence in eating; any solid food was dangerous, even for many days after the subsidence of fever. Of the cases of relapse among the troops, about one-third died. The fifth day was the most fatal day, and from 25 to 30 the most dangerous age. Plethoric men seemed to be more liable to attacks than thin, and fewer recovered; although many natives and coloured people were attacked, but few died. Boils and abscesses were not uncommon during convalescence.

We consider that no satisfactory conclusion can be arrived at with respect to the question of contagion; no new facts have come to light to solve this mystery; it will be sufficient to state that our opinions differ considerably.

Treatment.—Quinine, as a prophylactic, most signally failed; various principles of treatment were adopted during the epidemic; Blair's plan to "abort" the attack seemed to fail; so also did Dr. Stevens' saline treatment. No specific plan seemed to answer; any heroic treatment was actually dangerous; an emetic of ipecacuanha or of warm water was found useful, if given very early, and was generally followed by a mild purgative of castor oil or rhubarb, sometimes with the addition of a few grains of calomel; a warm bath, or even a foot bath, was sufficient to establish profuse diaphoresis, which state was then maintained naturally in most cases; cold applications to the head relieved the severe head-ache; a mustard poultice over the epigastrium gave great relief to the burning pain, and checked the irritability of the stomach; scarcely any other medical treatment was necessary during the stage of pyrexia, which usually lasted from one to three days.

The diet should at this period consist only of liquids, as barley water, iced milk and water, or other bland and harmless drinks. On the termination of the stage of pyrexia, even greater care is necessary, for the stomach then shows increased irritability; but the system at this period requires support; the only chance of nourishment being retained is to administer it in very small quantities, in teaspoonfuls, repeated after short intervals. The value of good nursing is thus evident; beef-tea, milk, arrowroot, and the white of egg, are all recommended by different practitioners. At the very commencement of the stage of remission, great attention must be paid to the state of the stomach and kidneys, this being the period at which dangerous congestions occur. Now diuretics may be necessary, such as liquor potassæ, liq. ammon, acet. potas nit., &c., as well as sinapisms over the kidneys, or blisters, or cupping may be useful. There should be no delay in treating kidney symptoms, as disorganization of the secreting structure takes place very rapidly where no treatment will avail. The same close attention must be directed to the state of the stomach; the application of blisters, or cupping may be found necessary, and frequently useful; great caution is required with regard to cupping; in many cases it is difficult to restrain the hœmorrhage.

The usual after-death appearances were observed on making post-mortem examinations; the connective tissue was universally injected with thin black blood; the membranes of the brain were congested, especially where a state of coma had existed, straw-coloured serum was found in the ventricles; the lungs were occasionally congested; the pericardium might contain also a straw-coloured serum; the heart itself was often flabby or softened and distended with dark thin blood; the fat of the omentum, and in fact the fat generally was tinged yellow; the liver varied greatly in appearance; in some cases it seemed healthy, or was olive or amber-coloured, fatty, or presenting a nutmeg appearance; the gall bladder was frequently half filled with a dark green bile; the mucuous coat of the stomach always presented a diseased appearance; it was rugose and softened, much congested or even inflamed in patches, the colour varying from a bright red to deep brown; shreds of epithelium, and also black vomit might at times be seen; both were found occasionally throughout the whole intestinal tube; the small intestines, especially the duodenum and jejunum, presented much the same appearance as the stomach, but less marked.

The kidneys were always more or less congested or inflamed; this was well marked in the pyramids, and, on pressure, the white creamy substance described by Blair and Lawson exuded from the papillæ; it consists of broken-down epithelium and granular tube casts from the tubuli uriniferi, the result of a more or less complete disorganization of the secreting structure of the kidney; the bladder was contracted, and its mucous membrane pale.

T. W. Barrow,
Deputy Inspector General of Hospitals.

Park B. Tucker, M.D.

F. Cogan, Surgeon Major,
2d Battalion, 2d Regiment.

(B.)

Bermuda, *alias* Somers Islands.

(GREAT SEAL.)

(signed) *W. G. Hamley*,
Lieutenant Governor and
Commander in Chief.

BY His Excellency Colonel William George Hamley, Lieutenant-Colonel in the Royal Engineers; Lieutenant Governor, Commander-in-Chief, and Vice Admiral in and over these Islands, &c. &c. &c.

To *Samuel Brownlow Gray*, Esq., Her Majesty's Attorney General for the said Islands; Staff Surgeon *Thomas Walter Barrow*, *Park Benjamin Tucker*, Esq., M.D.; Brevet Major *John Edward Hope*, Royal Artillery; Surgeon *Francis Cogan*, 2nd (Queen's Royal) Regiment, and Captain *Daniel Corrie Walker*, Royal Engineers; greeting.

WHEREAS an epidemic fever prevailed in these islands in the latter part of last year (1864), and was attended with considerable mortality, and I, the Lieutenant Governor aforesaid, have been required, by despatches from the Right Honourable Edward Cardwell, one of Her Majesty's principal Secretaries of State, bearing date at Downing-street the 24th of December 1864 and the 11th of January and the 18th of February 1865, to furnish accurate information concerning the origin and spread of the said disease. Now, therefore, know ye that I the Lieutenant Governor and Commander-in-Chief aforesaid, have thought fit to constitute and appoint you, and by these presents do constitute and appoint you, the said Samuel Brownlow Gray, Thomas Walter Barrow, Park Benjamin Tucker, John Edward Hope, Francis Cogan and Daniel Corrie Walker, jointly and severally Commissioners, and do hereby authorise and empower you, by all lawful ways and means, to make inquiry into the circumstances and history of the said epidemic fever in accordance with instructions which will be laid before you, and to report to me, the Lieutenant Governor aforesaid, upon all and singular the matters aforesaid. And all officers, civil and military, in these islands, are hereby required to be aiding and assisting unto you and each of you in conducting the said inquiry.

Given under my hand and the Great Seal of these islands, this 20th day of April 1865, and in the 28th year of Her Majesty's reign.

By His Excellency's command.

(signed) *Miles Gerald Keon*,
Colonial Secretary.

Gentlemen, Mount Langton, 24th April 1865.

I HAVE the honor to transmit to you a Commission under the Seal of the colony, authorising and empowering you to conduct an inquiry into the origin and spread of the epidemic fever which prevailed in these islands during the latter half of the year 1864.

Herewith I also send you for your guidance printed instructions which I have received from the Right Honourable the Secretary of State for the Colonies.

Guided by these instructions you will require no particular direction from me.

The manner of obtaining information, whether by printed or written question, or by *vivâ voce* examination, I think it unnecessary to prescribe, believing that you will adapt your method to each particular subject of inquiry so as to obtain the fullest and most valuable information.

Copies of the reports laid before Parliament of the Commissioners who reported on the epidemic which visited Bermuda in 1853, and of those who reported on the fever of 1856, will be furnished to each of you.

One of your requirements has been anticipated, inasmuch as a visitation from house to house throughout these islands has been made, for the purpose of framing statistical returns of the effects of the late fever. These returns will be laid before you, and will, I hope, assist your inquiry materially and save your time.

You will be good enough to keep an accurate account of necessary expenses arising out of this investigation.

I have, &c.
(signed) *W. G. Hamley,*
Lieutenant Governor and Commander in Chief.

Samuel Brownlow Gray, Esq., H. M.'s Attorney General,
Staff Surgeon Thomas Walter Barrow,
Park Benjamin Tucker, Esq., M.D.,
Brevet Major John Edward Hope, R. A.,
Surgeon Francis Cogan, 2nd (Queen's Royal) Regiment,
Captain Daniel Corric Walker, Royal Engineers,
&c. &c. &c.

(C.)

INSTRUCTIONS to COMMISSION of INQUIRY into the YELLOW FEVER at *Bermuda*, 1864.

1. You will inquire into the general health—

   a. Of the civil population,
   b. Of troops,
   c. Of shipping,

since the commencement of the present year, with special reference to the nature of the prevailing diseases which preceded the recent outbreak of yellow fever. This portion of the inquiry should include an account of the various types of fever which may have presented themselves during the above-mentioned period; and any relation which may be found to have existed between these fevers and the yellow fever, either as regards their symptoms, pathology, the localities where and the circumstances under which they presented themselves, should be carefully noted. And it should be stated to what extent yellow fever occurred in localities where the usual endemic diseases of the island present themselves.

2. You will next proceed to inquire into the yellow fever epidemic. In doing so, you will state the symptoms of the disease and its pathology, so far as you may be able to do so.

3. You will ascertain the precise date or dates and locality or localities where the first cases of yellow fever presented themselves—

   a. Among the civil population,
   b. Among the troops,
   c. Among shipping.

It is of the greatest importance that the precise history of all the earlier cases be carefully obtained and the localities stated. It is suggested that a sketch map should be prepared, on which the localities and dates of all these earlier cases, distinguishing the classes of population, as above, should be entered up to the time at which the disease became general.

4. You will prepare statistics of the epidemic, so far as the data at your disposal may enable you to do so. It is suggested that the following forms should be used for the purpose:—

STATISTICS of Yellow Fever among Civil Population.

Date.	Parish.	Population.	Attacks.	Deaths.	Remarks.

STATISTICS of Yellow Fever among Troops.

Date.	Barrack (if possible) where attacked.	Occupation.					Attacks.					Deaths.					Remarks.
		Officers.	Officers' wives and children.	Men.	Men's wives and children.	Others.	Officers.	Officers' wives and children.	Men.	Men's wives and children.	Others.	Officers.	Officers' wives and children.	Men.	Men's wives and children.	Others.	

Another table should show the strength of each corps in the island, divided into officers, men, women, children (including Civil Departments), together with a daily return of attacks and deaths in each corps from the beginning to the termination of the epidemic.

STATISTICS of Yellow Fever among Shipping.

Date.	Name of Ship.		Strength of Crew.	Attacks.	Deaths.	Remarks.
	Her Majesty's.	Others.				

The statistics of yellow fever at the dockyard should be separately given, and should include the population, together with the dates, attacks and deaths, distinguishing military, naval, civilians, and convicts.

5. If, from deficiency of data, it should be impossible to give the attacks and deaths day by day, in every such case the total attacks and deaths during the epidemic should be given, as, *e.g.* the strength, the attacks, and deaths in each barrack may be given, if the daily returns are deficient.

6. Having ascertained as far as practicable the statistical facts connected with the epidemic, you will proceed to inquire into the circumstances connected with the first appearance of the yellow fever in the islands during the recent epidemic. With this view you will prepare a meteorological table from such data as may be at your command, showing the climatic elements which have prevailed since the beginning of the present year. And you will point out any predisposing climatic conditions beyond those of ordinary years which in your opinion may have acted injuriously upon the health of the population.

7. You will examine and state your opinion as to any influence on the general health of the islands which may have arisen from the additions made to the shipping and population, in consequence of the blockade of the Southern American ports. Under this head will be included inquiries as to the state of the harbour, the general state of the shipping, as regards crowding and sanitary conditions generally.

8. Whether the houses of the civil population have been more than usually crowded in consequence of the increase of shipping.

9. Whether ships with yellow fever on board have arrived during the present year; with any circumstances following on such arrival.

10. You will examine the towns or districts inhabited by the civil population, with reference to the general condition of the surface as to paving, draining, and cleansing. Whether any progress has been made in house drainage and in abolition of cesspits since last epidemic. And state specifically what is the present condition of house drainage and privy accommodation of the population, and the influence it is likely to exert on public health.

11. Connected with this part of the inquiry is the condition of the water in the harbours. Whether the water has been more than usually charged with foul putrescing matters; the sanitary state of the beaches and foreshores; and whether nuisance has been experienced from them among the civil population, in barracks, or on board ship.

12. You will examine and report on the state of the water supply of the civil population, describing its source, mode of collection and storing, its probable amount, and state of purity or impurity; from what source water for the shipping has been derived, and its quality.

13. You will inquire into the amount and kind of influence, if any, which may have been exercised on the general health of the islands, and particularly of the troops, by marshy ground, creeks, &c.

14. With reference to the occurrence of yellow fever among the troops, you will make very careful inquiry into the following points:—

a. The extent to which the health of the troops may have been influenced by general defective sanitary conditions, affecting the condition of the air outside barracks.

b. State the average cubic space per man in every occupied barrack-room at the time the epidemic appeared, giving the information separately for each barrack.

c. The means of ventilation in use at the same period, and the state of the air in barrack-rooms, especially at night.

d. The nature and condition of the drainage, latrines, urinals, &c., of each barrack at the same period; and state particularly whether any nuisance was experienced in or around the barracks from any of these arrangements.

e. State the condition of the water supply of each barrack at the beginning of the epidemic, its source, amount generally used per man per day, its quality, and whether any influence was exerted by it on the health of troops in particular barracks.

f. Endeavour to ascertain whether intemperance prevailed to any extent among the troops before or at the time the epidemic attacked them, and send information as to the numbers punished for drunkenness or admitted into hospital, either directly or indirectly, on account of intoxication.

g. State whether attacks of fever were increased by exposure or duties.

h. If the troops in any barrack or position suffered considerably above the average, you will inquire particularly into the circumstances, and state your opinion as to the causes.

i. In like manner, if troops in any barrack or position have escaped or nearly escaped the disease, you will inquire particularly into the reasons and report them. If any particular portion of a barrack suffered more than another portion, you will inquire into and state the reasons.

k. You will inquire into the state of the hospital accommodation as regards the cubic space actually occupied by sick men before the epidemic, and also during the epidemic, stating the cubic space per bed at time of greatest crowding.

l. You will also report on the state of the ventilation of the wards, and on the condition of drainage and water supply of the building.

15. You wil next describe minutely the measures taken for preventing attacks of the disease. Under this head you will state,—

(1.) The date when the men in particular barracks were attacked by the disease.

(2.) The date when the men were either wholly or partially removed out of the barrack.

(3.) The position where they were encamped, and the approximate numbers placed on it.

(4.) The class of accommodation provided for camping out, the numbers of men per tent, or the cubic space per man, as the case may be.

(5.) You will carefully describe the effect of camping out on the health of the troops.

(6.) The date at which troops were sent on board ship, the numbers so sent, and the effect on their health.

(7.) State any steps which were taken for improving the sanitary condition of the barracks themselves as regards ventilation, cleansing, lime washing, &c.

(8.) You will state the date at which sick were camped out, the place, the kind of accommodation, the number of sick disposed of in this manner, and the effect of camping out on the progress and termination of the cases, as compared with the results of cases treated in the hospital.

(9.) You will further state whether any particular modes of treating the yellow fever appeared to be more efficacious than others. If so, describe their nature.

16. Describe the sanitary measures adopted for protecting the civil population and shipping from the epidemic.

17. An important part of your inquiry relates to the class of sanitary works necessary for improving the health of the islands and diminishing the liability to fever. Under this head, you will include information as to the drainage and reclaiming of swampy ground, improving the heads of creeks, improving the circulation of water in lagoons, drainage and water supply of towns, improvements in harbours and beaches, general improvements in sanitary police, and any other measures by which, in your opinion, the health of the population would be protected from epidemic diseases.

18. You will report similarly upon sanitary works for barracks and hospital, including drainage, water supply, improved latrines and urinals, improvements in the general construction of existing buildings, their means of ventilation, &c., and the extent of improved barrack accommodation required, in case any of the existing barrack accommodation should be considered unfit for occupation, or where the construction of the barrack is such as to render a large cubic space per man necessary in order to its being occupied with due regard to health.

19. This report is to be in addition to the information already requested by Lord de Grey to be furnished on the printed forms of the "Barrack and Hospital Improvement Commission," which have been lately sent to Bermuda.

(D.)

BERMUDA.—EPIDEMIC of 1864.

QUESTIONS, No. 1.

QUESTIONS issued by the Commissioners to Civil Authorities, Medical Practitioners, and others, applicable to Civil Population.

1. What is your name, residence and profession, or calling, and how long have you practised it, and where?

2. As far as the same came under your observation what was the general health of—

(*a.*) The civil population,
(*b.*) The troops,
(*c.*) The ships of Her Majesty's navy and the mercantile marine,

from the commencement of 1864 to the time when yellow fever made its appearance?

3. During the period adverted to in the former question was there any peculiar type of fever, or other disease, prevalent in your locality or practice?

4. If any such fever did prevail in your locality or practice, can you trace any, and if any, what, relation between it and yellow fever, either as regards symptoms, pathology, or locality?

5. To what extent did yellow fever occur in the localities where the ordinary endemic diseases of the Colony present themselves?

6. What, according to your experience or means of judging, were the symptoms and pathology of the epidemic of 1864?

7. Did that epidemic differ in any respect from former epidemics of the same name of which you have had personal experience, and if so in what respect?

8. Within your practice or experience, when and where did the first cases of the epidemic of 1864 occur among—

(*a.*) The civil population,
(*b.*) Her Majesty's troops,
(*c.*) The ships of Her Majesty's navy and the mercantile marine, giving the dates of arrival of and ports from which any ships referred to by you arrived;

and what were the histories of those earliest cases? And distinguish as accurately as you can the class of persons first attacked, whether Europeans, &c., or natives, and whether immediately or otherwise connected with shipping.

9. State any circumstances connected with the first appearance of the yellow fever in 1864; and point out any predisposing climatic conditions beyond those of ordinary years which may in your opinion have acted in that year injuriously on the health of the population?

10. Do you consider that the additions made to the shipping and population in consequence of the blockade of the Southern American ports exercised any influence on the general health of the islands? And what circumstances within your experience or practice can you refer to as throwing light on this head of inquiry?

11. What was at the commencement, and during the prevalence of the epidemic of 1864, the state of the ports and harbours, and of the shipping in harbour, as regards crowding and sanitary conditions, generally?

12. Were the dwellings of the civil population in your neighbourhood more than usually crowded at the commencement of the epidemic in consequence of the increase of shipping?

13. State whether any ships with yellow fever on board arrived in Bermuda during the year 1864, and if so when and whence and from what source you derive your information on this point, and also any circumstances following on such arrival which you can connect with the subsequent appearance of the epidemic?

14. Within your observation has any progress been made in house drainage, and the abolition or improvement of cesspits, since the epidemics of 1853 and 1856 respectively?

5. Can you state whether the waters of the harbours were more than usually charged with foul or putrescing matter in the year 1864? And what, according to your observation, was the sanitary state of the beaches and foreshores as regards their influence on the health of—

(*a.*) The civil population,
(*b.*) Her Majesty's troops,
(*c.*) The crews and other persons on board Her Majesty's ships and the merchant shipping?

16. What was the state of the water supply of the civil population, what its source, and what its mode of collection, and storage? What was its probable amount and its quality as to purity or impurity? And how and whence was water supplied to the shipping, and what was its quality?

17. Within your observation what influence was exercised on the general health of the islands, and on the health of the troops in particular, by marshy grounds, swamps, creeks, grave-yards, or other special local conditions?

18. What sanitary measures were adopted in your neighbourhood for protecting the civil population and the shipping from the attacks of the epidemic?

19. Be so good as to furnish any reliable meteorological data or observations of which a cotemporaneous record was kept, during the spring, summer and autumn of 1864.

20. State generally what class of sanitary works you consider necessary for improving the health of the islands, and diminishing their liability to fever; and furnish any information or suggestions which you may deem useful with regard to the drainage or reclaiming of marshes, or swampy ground, the improvement of creeks and circulation of water in lagoons, the drainage and water supply of towns, the improvement of harbours and beaches, the improvement of sanitary police, and other means, by which the health of the population may be guarded against the prevalence of epidemic diseases.

(E.)

BERMUDA.—EPIDEMIC of 1864.

QUESTIONS, No. 2.

QUESTIONS issued by the Commissioners to heads of Military and Naval Departments, Commanding Officers, and others, applicable to Her Majesty's Land and Sea Forces.

1. To what extent was the health of Her Majesty's troops influenced in your judgment in 1864, by general defective sanitary conditions, affecting the condition of the air outside of the respective barracks?

2. What, at the commencement of the epidemic fever of 1864, was the average cubic space per man in every occupied barrack-room, giving the information separately for each barrack?

3. What at that time were the means of ventilation in use, and the state of the air in barrack-rooms, especially at night?

4. What were the nature and state of the drainage, latrines, urinals, &c., of each barrack at that period? And state particularly whether any nuisance was experienced in or around the respective barracks from any of these arrangements.

5. What at that period was the state of the water supply of each barrack, what its source and quality, and what the quantity used daily per man? And was any influence exerted by any of these circumstances on the health of the troops in each or any particular barrack?

6. Did intemperance prevail to any extent among the troops before or at the time when the epidemic appeared among them? Furnish any information you may possess as to the numbers punished for drunkenness, or admitted into hospital directly or indirectly from the consequences of intoxication.

7. Were attacks of fever increased by exposure or military duties?

8. What was, at the commencement and during the prevalence of the epidemic, the state of hospital accommodation for Her Majesty's troops, as regards the cubic space per men actually allowed the sick? And what was the cubic space per man and per bed at the time of greatest crowding?

9. What was the state of the wards as regards ventilation, and what the condition of the drainage and water supply of the military hospitals?

10. Were the men wholly or partially removed out of the respective barracks, and what were the dates of such removals, and of any subsequent changes of quarters?

11. What were
   (*a.*) The respective positions where the troops were encamped?
   (*b.*) The approximate numbers placed in each position?
   (*c.*) The class of accommodation provided for camping out?
   (*d.*) The number of men per tent and the cubic space per man?

12. What was the effect of camping out on the health of the troops?

13. When were the troops sent on board ship? What numbers were so shipped, and what was the effect on their health?

14. On the appearance of the epidemic, what steps were taken for improving the sanitary condition of the barracks, as regards ventilation, cleansing, limewashing, &c.; and what steps for improving the condition of drains, cesspits, latrines, urinals, and collections of stagnant water and other deleterious matter, under or about the respective barracks?

15. When were the sick among the troops first camped out; and what was the number of sick disposed of in that way, and what the effect of camping out on the sick, both generally, and as compared with the results of cases treated in hospital?

16. According to your experience or observation, was any particular mode of treatment of yellow fever more efficacious than other modes? And if so describe its nature.

17. What was the date of the arrival in Bermuda of the troops to which you refer in your answers to these questions or any of them?

18. Furnish, if you can, any reliable meteorological data or observations, of which a cotemporaneous record was made, during the spring, summer, and autumn of 1864, and state where the record was kept.

19. Have you any suggestions to offer for sanitary works, or improvements of barracks, hospitals, and encampments, with reference either to drainage, water supply, latrines and urinals, or other arrangements bearing on the health of the troops? Or with regard to improvements in the construction of existing buildings, their means of ventilation, &c., or the extent of additional barrack accommodation required, in case the existing barracks should be deemed unfit or insufficient for occupation by Her Majesty's troops; or with a view to increasing the number of cubic feet per man allowed the troops, in case a larger space should be demanded, by a due regard to their health? and state generally any other views which experience or observation may have suggested to you, as having a bearing on the means of diminishing the liability of these islands, and especially of Her Majesty's land and sea forces stationed here, to similar visitations in future?

(F).

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ANSWERS to QUESTIONS No. 1 received from—

The Mayor and Corporation of the town of Hamilton - - - - - - - - - - 31
Park B. Tucker, Esq., M.D. - - - - - - - - - - - - - - 34
Benjamin Burland, Esq., M.B., Surgeon R.A., Health Officer - - - - - - - - 36
Frederick A. S. Hunter, Esq., M.D. - - - - - - - - - - - - - 41
Assistant Surgeon Crosbie, R.N., Her Majesty's Ship "Terror" - - - - - - - 43
Surgeon Major Cogan, 2d (Queen's) Regiment - - - - - - - - - - 44

ANSWERS of the Mayor and Corporation of the Town of Hamilton, forming also the Board of Health for the said Town.

2. As far as came under our observation, we think the general health of the civil population from the commencement of 1864 to the time when yellow fever made its appearance, was good. That of the troops, and ships of Her Majesty's Navy, and the mercantile marine, we have no reason to think was otherwise during that period.

3. We are not aware of any such having existed during that period.

4. We answer this as No. 3.

5. The yellow fever begun at St. George's, in the months of May and June, and

gradually became very virulent there, thence gradually spread itself over the whole of Bermuda, more or less, as circumstances and density of population favoured it.

6. This can be best answered by medical men.

7. We are not aware that it did; some, however, believe, we had two kinds of fever here at the same time, one the yellow fever, introduced from Nassau, New Providence; the other from Wilmington, called "the Wilmington fever." Whether it were so or not, we cannot positively assert; but we know this, a very large proportion of the fever cases were successfully treated, without medical aid; while the lesser number, even with medical aid, suffered severely, which forcibly argues that two fevers at least must have existed at one and the same time, differing from each other in severity very materially.

8. The first cases of the epidemic of 1864 occurred in St. George's, as stated in answer to No. 5.

9. We know of no predisposing climatic conditions in 1864, beyond those of previous ordinary years.

10. Additions were made to the shipping and population in consequence of the blockade of the Southern American ports, and the number of fever cases was not only increased by them, but such cases exercised a very prejudicial influence on the general health of the islands.

11. During the prevalence of the epidemic of 1864 the state of the port and harbour of Hamilton was good, and were not crowded with shipping, so as to affect their sanitary condition.

12. They were not.

13. Many ships arrived here with yellow fever on board during the year 1864, which occasioned their being sent into quarantine, where they were attended to by a health officer.

14. We have a standing ordinance in the town of Hamilton for sanitary purposes. The houses have cesspools for receiving night soils, which we have reason to think are occasionally cleaned out, or covered with earth mixed with lime or chloride of lime; and in fever time particularly, the Board of Health have required the owners of them to see that was done.

15. The waters of Hamilton Harbour were not unusually charged with foul or putrescing matter in 1864. The harbour has no beaches, nor were its foreshores in a condition to act injuriously on the health of the civil population or crews of merchant shipping being there. There were no troops stationed at Hamilton; nor ships of war.

16. The civil population are always supplied with rain water, and so are the shipping, caught in stone tanks.

17. Our marshes have no deleterious effect on the general health of the islands, or on the health of the troops. Nor have we creeks producing any such effect, at least in the absence of imported yellow fever for 10 or 15 years at times successively. They never have shown themselves capable of generating so foul a disease as the yellow fever.

18. Nothing more than what cleanliness and a strict attention to the preservation of health dictated.

19. We have no meteorological data to furnish for the spring, summer, and autumn of 1864.

20. We answer partly as we have before done to similar questions in 1853 and 1856.

Open air in the day-time and well ventilated rooms in the night are matters of essential importance for preserving the health of the community generally. But with respect to soldiers and sailors living together in numbers, they should sleep in no room, during the summer months in particular, that is not well ventilated. Dispersion as practised in 1843 and 1853, and the removal of the sick from the well. The soldier's tent is ventilated from top to bottom. Besides that, it is made of a material which allows rarified air to escape from it, and because it is so, it becomes perhaps their best refuge from yellow fever; vessels may be ventilated by pipes leading through their decks.

As to our marshes occasioning yellow fever, we have no reason to think them capable of inflicting such an evil upon us. The summer is always the time for ditching them; no one thinks of doing so in winter; the rains prevent it. In summer they have less water in them, and then their flags, ferns and grasses grow with the greatest luxuriance, no way offensive or deleterious. Within the last 25 years much has been done in ditching them, and sometimes the work has been carried on throughout the summer, but in no instance have we known so baneful a disease as the yellow fever to result from it.

In all of our creeks and harbours the tide ebbs and flows throughout the year twice in 24 hours; and the waters of them being thus acted upon jointly with the action of the winds upon them, can in no way become stagnant; in fact, it may well be said from these causes the circulation of their waters is constantly taking place from top to bottom.

The water from the streets of Hamilton is all carried off by surface drains to sunken pits in connection with the sea water, made for the purpose of receiving it. The streets are all 50 feet wide, and are kept clean by corporation regulations. We have no burial ground in the town, and but one slaughter-house in it, where but few cattle are weekly slaughtered. Pigs are sometimes kept in the town, one here and there to a family. There are no lanes, small houses, or back yards, kept in a filthy state that we know of. In the late fever, we found but little to remedy in this way. The inhabitants generally are comfortably situated, and keep all about them clean and in good order. We know of no circumstance bearing upon the probability of fever being engendered or aggravated by the situation and condition of the Town of Hamilton.

The yellow fever not being a fever of our climate seldom appears in Bermuda; when we have it it is brought to us. Treating it then as an imported disease, the best means to prevent our having it is to guard against its introduction by strict quarantine regulations, which, if properly enforced, will in a great measure prevent it.

A year seldom goes by but one or more foreign vessels come here with yellow fever, for medicine, provisions, and other necessaries; sometimes for medical aid. The vessels with their crews are always rigidly quarantined; no one is permitted to visit them but the health officer; and as soon as circumstances permit, they go away without infecting us. We say so, because we know of no case to the contrary; in fact, we benefit them without their injuring us.

Men-of-war steamers also frequently come here with yellow fever, and are also quarantined, but on their wants being supplied, immediately leave us for a more northern climate, as the best of quarantine regulations for the cure and prevention of the yellow fever.

On this principle, the soldiers were sent to Halifax from here in 1864, and the climate of that country did not falsify the expectations of those who sent them there, for although some of them had fever on the voyage, and, it may be said, actually carried it to Halifax, still that climate prevented it spreading by forming itself into a contagious disease.

With respect to quarantine regulations, we may observe, in general terms, that the value of them very much depends on being carried into execution by the health officers. Dr. Hunter, health officer for the Port of St. George, in a letter to Governor Reid, 4 May 1844, states "The 'Trent' Royal Mail steamer arrived on the 22d July 1842, in Murray's Anchorage, with several cases of yellow fever, when the captain and surgeon both assured him, that the cases in question were mere colds, and it was only from personal observation, by visiting the sick bay, that he ascertained the nature of their disease. Two or three of the cases alluded to proved fatal on the voyage to England, which, taken as evidence, clearly shows: first, that interested witnesses cannot be depended on; and second, that health officers, without great care and vigilance, will be imposed on, and innocently assist in introducing yellow fever amongst us."

But let the yellow fever be once established in the island, no matter from what cause it becomes so, the quarantine regulations cease to be of use in arresting the horrors of its attacks upon us on shore; other means and regulations must be adopted for that purpose; but here, again, incidents interpose to thwart our wishes, and render our best arrangements inoperative. The fever spreads and continues to spread in spite of all we can do to prevent it; to wit,—

On the fever of 1864 breaking out in St. George's, the blockade trade there was in full operation; this brought us in connection constantly with persons going to and from Wilmington and Nassau; the price of labour advanced to double and sometimes treble its former rates, which induced a number of our labourers to go there for employment from all parts of the country, and when any of them took the fever, they left St. George's immediately for their homes in the country.

The crews of the blockade runners being only shipped for the voyage round, that is, from Bermuda to Wilmington and back again, were on their arrival paid off, and not reshipped again until the vessel was ready to sail for Wilmington. The interval was seldom less than a week, but sometimes was extended to two weeks, which enabled them to spend as much of their money as they pleased, and to go where they pleased about the island. Numbers, of course, came to Hamilton, and it is not to be wondered at, that a blockade sailor, with his pocket full of money, should be gladly taken in and nursed, as was the case, by those amongst whom he was stricken down with fever, whether in St. George's or Hamilton, or elsewhere.

In this way the fever was spread about the country, and more particularly so in the parishes nearest to St. George's, which furnished the largest number of labourers to the blockade runners; no police regulation could have prevented it; that is, the labourer could not have been kept from his home, nor could the blockade sailor have been prevented going about the country.

Towards the last, several blockade steamers came to Hamilton; also vessels from England with coal and merchandize for them. These steamers paid off their sailors on arriving here from Wilmington, and employed labourers in their stead, not reshipping them again until they were ready for sea; thus establishing at Hamilton the same means for spreading the fever as similar means had occasioned in St. George's.

Although those evils could not be prevented, still much was done to check the progress of the disease, and every one did his best in this respect. But nothing acted with more force and benefit in guarding the health of the public generally from it than the hospitals appointed by the governor and council for the reception of fever patients. The one in Devonshire, near Hamilton, was freely made use of by the Corporation Board of Health, and we take pleasure in testifying to its usefulness; except the appointment of these hospitals.

hospitals, and the enforcement of particular sanitary measures for inland purposes, we are not aware more was done or could have been done.

The Board of Health could in no way interfere with the shipping in port, except they had fever on board of them, or contained infectious matter; nor could the health officer or any other local authority do so, but in such cases, then they could send any such into quarantine. The Board of Health also had authority to receive persons landed from them with fever, and send them to the public hospital, which they did always without loss of time, knowing full well an enemy like the yellow fever often destroying one in less than three days, was not to be trifled with. As to sanitary measures for the cleanliness of the ship, and health of the crew, the Board of Health had nothing to do with them; the master himself had to devise and execute all that was necessary for that purpose, and to show how well at times he could do so, the following statement can be relied upon.

A large English steamer the "Melita," 853 tons, Captain Higginson.

Captain Higginson states, he left Liverpool the 8th August 1864, arrived off St. George's the 23d August; all well; crew, 37; passengers, 18. On the 26th went to Grapy Bay, lightened ship, and thence to Grinaway's Deep, near Hamilton, on the 9th September; on the 12th September came to Hamilton; hauled to a wharf, where the steamer remained until the 3d October, on which day she left for St. George's; during the whole of this time (38 days) the crew remained healthy and without fever.

Treatment of Ship and Crew.—Captain Higginson was a total Abstinence man himself.

Crew.—Total abstinence, and no liberty allowed on shore.

Vessel.—Fully awned; upper decks washed twice a day, morning and evening; cabins fore and aft, including forecastle, cleaned daily; the latter whitewashed once a week, and bedding aired fore and aft. The fore and after holds whitewashed, the former three times, the latter twice; the engine-room kept quite free from bilge water, and whitewashed. Throughout the whole ship, fore and aft, cloride of lime used daily and plentifully. Crew on fresh provisions the whole time from Grapy Bay, and had the privilege of using salt water baths at their pleasure, such being provided for them on board.

The "Melita" not having fever on board of her while it was raging violently in the town of Hamilton, and on board of vessels near and round about her, shows not only the value of Captain Higginson's sanitary measures, but how much his crew were indebted to him for his care of them; and it is reasonable to conclude, on similar regulations being made by householders and others, and particularly by masters of vessels coming here during the prevalence of a yellow fever, that like benefits would result from them, at least in whole or in part, as the regulations may be put into practice.

By order of the Board of Health, town of Hamilton, Bermuda, 22 June 1865.

Henry James Tucker, Mayor.

ANSWERS of *Park Benjamin Tucker*, Esq., M. D.

1. Park Benjamin Tucker, town of Hamilton, Pembroke parish, private practitioner for the last 22 years in various parts of the Island.

2. The general health of the civil population, the troops, navy, and mercantile marine, was remarkably good from the commencement of 1864 to the time when yellow fever appeared.

3. In my locality or practice, no peculiar type of fever, or other disease, was prevalent.

4. Answer 3 applies to this question.

5. We have no diseases endemic to the colony.

6. The symptoms were generally ushered in by general lassitude, headache and weakness, nausea, white-coated tongue, thirst, pulse from 100 to 120 per minute. These symptoms were generally preceded or followed by rigors, pain of back and limbs, very hot skin. For about 16 hours after that period a disagreeable, warm, sandy feeling of skin was experienced rather than great heat, with pain and sense of weight on the stomach. If no improvement took place within 48 hours from the first, all the symptoms increased with a rapid cleansing of the tongue, which to a stranger often proves very delusive.

I am of opinion that the blood, in yellow fever, is so thoroughly poisoned, and its properties so changed, becoming, as it were, often too thin to be retained by the blood vessels and tissues, that life can scarce be sustained beyond a few days, unless renovated by some remedial agent as yet not discovered. I am disposed to believe that some preparation of iron may prove an antidote, or, at least, a very powerful curative agent. In my own practice I have frequently used, after the second day of fever, the preparation of citrate of iron and quinine with the happiest results.

7. The peculiar symptom of black vomit was, in my experience, more frequently met with.

8. My first case occurred on the 5th August in the town of Hamilton in the person of a seaman (a Swede) belonging to steam ship "City of Petersburg" then lying at St. George's, which town the patient left on 1st August, but was not taken ill until the 3d of

that month. The persons first attacked were principally Europeans and southerners, chiefly connected with shipping.

The two next cases that came under my notice and practice were at Prospect Hill, Devonshire parish, distant from the first case about a mile a half, in no way connected. The situation is elevated and healthy, nor was there any case of yellow fever in the neighbourhood to my knowledge. The circumstances of these cases were very peculiar. The house is large, well ventilated, and isolated. It was occupied by one Onion's wife and three children. The man is a sapper of Royal Engineers, in charge of Government property. The family were visited on the 11th of August by a patient, one Hill, discharged only the day before from the Civil Fever Hospital at St. George's. Mrs. Onions remarked to her husband how peculiar "Hill smelt," and "hoped that he had not brought them the fever." On the 13th one of the children, a girl nine years of age, who had been sitting on Hill's lap, was seized with severe symptoms of yellow fever, which proved fatal on the 19th, with black vomit. On the 14th of August Mrs. Onions was attacked with the same disease, and recovered. The father and the two other children escaped, although exposed by night and day to any influence that may have existed.

9. The Islands were, in my opinion, very healthy, and no climatic conditions existed beyond those of ordinary years, liable to induce yellow fever.

10. In some measure, as the town of St. George's was very crowded, and accommodations difficult to obtain. The poor strangers and seamen consequently were exposed night and day to influences likely to induce fever. Several of the vessels were reported to have arrived from infected ports.

11. The harbours were very crowded, and St. George's particularly so, both previous to and during the epidemic, and their condition must of necessity have been more or less affected.

12. The hotels and lodging houses were more crowded than usual, not the dwellings generally.

13. I have understood that several vessels arrived at the Port of St. George's from Nassau, where yellow fever was prevailing. One vessel in particular, the steamer "Fanny"; and the first case that came under the public notice, was in the person of a seaman from that vessel, who, I understand, died on the 7th July.

14. No improvement in house drainage, or abolition of cesspits, since the epidemic of 1853 or 1856, has come under my observation.

15. From the great increase of shipping, I have no doubt that the harbour of St. George's was charged with foul matter, and may have, in some measure, affected the health of the civil population, troops, and mercantile marines. The port of Hamilton was not so crowded as, in my opinion, to have been injurious. I do not consider that the foreshores or beaches in the Port of Hamilton influenced the health of population or troops.

16. To the best of my knowledge the water supply was sufficient, and good both for civil and military population. It is rain-water, kept in tanks. The shipping is supplied from the same source.

17. I did not observe any influence exercised on the general health of the Islands, or Her Majesty's troops in particular, from marshy grounds, swamps, grave yards, or any special local conditions.

18. Owing to the prompt action of the Legislature, three charity hospitals were established for the reception of paupers, seamen, and strangers: one in each town, and one in the Island of Somerset. Lime washing, and some attention to cleanliness, were the only other means adopted that came under my notice.

19. I am unable to reply to this question.

20. The draining and reclaiming of marshes would certainly be attended with good results, although I have never noticed that fever was more frequent or malignant in such localities. The marshes are mostly salt, and influenced by the tides, which may account for their being so innocuous.

The town of St. George's in particular may be made much less liable to engender fever by more attention to general cleanliness, and by improving and widening the streets, and enforcement of strict sanitary police. Legislative provision has been made for the above purpose, and is in course of being carried out, though, from peculiar circumstances, such improvement must necessarily be slow.

ANSWERS of *B. Burland*, M.B., Assistant Surgeon, Royal Artillery. Health Office, East End.

1. Benjamin Burland, M.B., &c., &c., Assistant Surgeon, Royal Artillery. Graduated in Arts and Medicine in the years 1857 and 1858. Entered Her Majesty's service on the 1st December 1858, since which period have been stationed in England, Ireland, and Bermuda.

2. I cannot say, as far as came under my observation, that the general health of the community was peculiarly affected, except that in the spring of 1864, very general lassitude and languor prevailed.

3. After a rainy autumn, an epidemic of "Deuque," or "broken-bone fever," appeared in October 1863, amongst the Royal Artillery and Royal Engineers, the first case occurred on the 6th October, and the last on the 16th December. During this period, 74 men, 26 women, 19 children, and 16 officers were attacked in the two corps. There was no fatal case. The effects of this fever may have induced debility during the period adverted to in question No. 2. Bilious remittent fever prevailed to a limited extent immediately before the outbreak of yellow fever.

4. Both these fevers closely resembled mild cases of yellow fever, in the mode of invasion, course, and organs affected, but differed in being attended with decided exacerbations and remissions. The immediate relation between these and the yellow fever is not easily determined.

The poison of yellow fever, gradually accumulating, may have developed itself in these fevers, but wanting the peculiar spark, an outbreak did not ensue, until perhaps that spark was introduced from another country.

5. As far as I can judge, yellow fever prevailed universally. Few, if any localities, escaped.

Symptoms.

6. Insidious in its invasion, and Protean in form, the symptoms were generally those referable to gastro-hepatic derangement. Constipation, followed by black tarry stools, nausea and vomiting, ushered in by rigors, hot burning skin, with high fever. In many cases, violent cerebral excitement, delirium, and insomnia existed. In other, suppression and retention of urine. Between the mildest form, however, and the most terribly malignant, there was every diversity of grade. The poison, whether arising from a peculiar miasma, or from organic germs, quickly pervaded every structure of the body, through the medium of the blood, expending its force principally on the mucous membrane of the stomach and intestines.

Pathology.

7. I have had no personal experience of other epidemics of yellow fever.

8. The earliest *unequivocal* cases are shown by the following tabular form:—

No.	Name.	Date of Attack.	Date of Death.	Remarks.
1	— Alton - - - -	25 June -	30 June -	Passenger from Nassau, per S. S. "Fannie."
2	Geo. Williams - - -	10 July -	17 July -	Passenger from Wilmington, per S. S. "City of Petersburg."
3	Serjeant Cooper, 39th Regt.	16 July -	22 July -	Living with 39th Regiment at St. George's.
4	Gunner G. Ross, R.A. -	23 July -	31 July -	Hospital Orderly at R. A. Hospital.
5	Thomas White - -	24 July -	30 July -	Servant to Captain Lockhart, R.E.

Cases of Tucker.

Three coloured men, named Tucker, living at Harrington Sound, are alleged to have been treated for yellow fever, on the 20th, 22d, and 23d June, by Dr. Outerbridge. I append their statements, *vide* Appendix (A.)

Cases of Surgeon Major Franklin and coloured female servant.

The cases of the late Serjeant Major Franklin, P.M.O., and his coloured female servant, both treated by me for bilious remittent, I now consider as having been modified cases of yellow fever, which assumed, as nearly all the early cases did, a remittent type. Mr. Franklin rallied, and was convalescent, but soon fell into a typhoid state from inanition. He was attacked on the 11th July, and died on the 26th July. His servant (subsequently attacked) recovered.

S.S. "Fannie."

The first fatal case of fever having been indirectly connected with the steamer "Fannie,"

"Fannie," and a paralytic man having been carried from her on shore, in the presence of numbers, and as she had come from Nassau, report accordingly pointed to her, with many curious and interesting, although unfounded details, as the polluted source of infection.

This vessel, engaged in the blockade-running trade, left Nassau on the 9th June, and arrived in the harbour of St. George's on the morning of the 13th June. As the yellow flag was not hoisted, I did not therefore visit her in my capacity as Health Officer, until in the afternoon I was requested by His Excellency the Governor, Lieutenant Colonel Ord, R.E., to inspect the vessel, in consequence of information he had received, that yellow fever had just appeared in Nassau. I most carefully examined the ship, master, and those of the crew, &c., who were on board.

The majority of those were on shore, and many in Hamilton; I did not therefore see them; I was quite satisfied that there was then no trace of infectious disease on board, and reported accordingly; next day, 14th, Nassau was proclaimed an infected port. The "Fannie" then coaled at Fisher's Wharf, and sailed on the 15th June for Greenock, where she arrived on the 27th June, without fatality or sickness of any description.

Nassau proclaimed 14th June.
S.S. "Fannie" sailed, 15th June.

Nine persons who had come in her from Nassau remained behind, viz., three firemen (deserters from the ship, names unknown), Alton (the first case), M'Kewan, an engineer, paralytic, and who left for America, in the same state as when he arrived; Mr. Clarke, who left immediately for St. John's, New Brunswick; Marshall, a Wilmington pilot, and a W. Fitzgerald, both of whom remained only a few days; and lastly, Mr. Jervay, agent of the "Fannie."

Nine persons remained.

I append extracts from his letter, Appendix (B). Alton was stated to be suffering from chills and fever (intermittent fever), and M'Kewan as paralytic; the latter I saw in the afternoon, by Dr. Hunter's request. The former I did not see at any time; he, however, applied for professional advice to Dr. Hunter, who treated him for intermittent fever, and moreover recognised the type as "tertian." During the interval between the 16th and 23d June, Alton walked about and enjoyed himself, and expressed himself as being quite well.

Mr. Jervay, agent.
Alton's case.

On the 23d June he again applied to Dr. Hunter for advice, and finally, on the 25th June, when nausea, vomiting, &c., came on, febrile symptoms soon appeared, and black vomit (or a fluid very much resembling it, in the opinion of the people of the house, as Dr. Hunter did not see the black matter ejected on any occasion), and jaundice closed the scene. He died early on the morning of 30th June. Dr. Hunter frequently alluded to him, in his last illness, as a suspicious case; but I did not visit him, fearing to convey infection (or the imputation of it) to the troops under my care. During his stay in Bermuda, Alton lodged in the house of a coloured man named Walsh, situated in a remote spot in the valley, between Mr. A. J. Musson's house and Fort George. In this house he died. On consulting with Dr. Hunter the evening before Alton's death (which was then imminent), we recommended immediate burial and destruction of all clothes, &c., in the place.

Died.
Lodged with Walsh.

These proceedings were deferred until the afternoon, in consequence of an inquest, held by order of the coroner, Mr. W. Tuder Tucker, when a verdict was returned to the effect, that Alton had died by the visitation of God; but whether of yellow fever or not the jury could not determine. Alton was then buried with his clothes, &c., in the public cemetery.

Inquest.

Walsh and his family were placed, by my advice, under canvas, and guards posted over them for 18 days, to prevent communication. The house was thoroughly cleansed, fumigated, &c., and no case of fever appeared there again until late in August, when it was raging all through St. George's.

With respect to the second fatal case, that of George Williams, it is clearly established that he arrived on the 10th June, in the screw steamer "City of Petersburgh," from Wilmington and Nassau. But the dates utterly preclude the possibility of infection, or such a protracted stage of incubation. The "City of Petersburg" left Nassau (having been chased back from Wilmington) for Wilmington on the 27th May, took in cargo, and arrived at Bermuda on the 10th June. Thus, as Williams was attacked on the 10th July, 34 days must have elapsed since he left Wilmington, and 45 days since he left Nassau: he lived altogether on board the "City of Petersburg," until she sailed on the 24th June, when he first came to lodge (in a house adjoining the civil prison) with Jones, a coloured man, who states that Williams had no communication directly or indirectly with Walsh, his family, or Alton. He was attacked on July 10th, and died on the 17th July, deeply jaundiced, and having black vomit, &c.; he was buried without any delay.

2d Fatal Case. George Williams.
Died 17 July.

On the morning after Williams's death, the 18th, a man living at Oakley's (near the Wesleyan chapel) was found dead. This case was also reported as another of yellow fever, but the depositions taken before the mayor of St. George's show that death was from intemperance.

Spurious case.

Serjeant Cooper, of the 39th Regiment (third fatal case), lived under canvas at the rear of the Royal Barracks, having had no communication with either of the former cases. He was attacked on the 16th July, and died on the 22d July, with black vomit, and deeply jaundiced. I did not see him during his illness, but he was attended by Assistant Surgeon Everet, 39th Regiment, Surgeon Cogan, 2d Battalion 2d Queen's, and Staff Assistant Surgeon Pennington, all of whom pronounced it to be a case of yellow fever.

3d Fatal Case. Serjeant Cooper, 39th Regiment. Died 22 July.

Gunner Ross, R.A. (4th fatal case), was my hospital orderly, and had been living for a considerable

4th Fatal Case. Gunner Ross, R.A.

considerable time in the Royal Artillery Hospital adjoining the wharf, known as Penno's Wharf. He was attacked, after a debauch, on 23d July, without having had any connection whatever with any of the three former cases.

Although I had never before seen a genuine case of yellow fever, I at once recognised the disease. High fever, white pasty tongue, frontal pain, suffused eyes, &c., pointed but too plainly to the fearful nature of his malady. I did not see him after the 26th July, as, on that day, I was myself attacked, and placed on the sick list. Ross died on the morning of the 31st July, having black vomit, and deeply jaundiced; buried immediately. Died 31st July.

5th Fatal Case. Thomas White. Thomas White (5th fatal case), a native of Scotland, and civilian servant to Captain Lockhart, R.E. (with whom he had recently come from Canada), was admitted into the Royal Artillery Hospital, under my care, on the 26th July. He had been living at Captain Lockhart's residence in the town, and greatly feared the fever.

His symptoms, when I first saw him, were more of a typhoid nature, but the disease was recognised, and treated as yellow fever.

Died 30th July. He died on 30th July, with black vomit, jaundiced; buried immediately.

I think it is by no means proven that yellow fever was introduced from Nassau by the "Fannie" or any other steamer, although it is very probable that such was the case. It may be that the atmospheric condition of the islands was such that, charged with the poison, it required but the peculiar spark which, when introduced from Nassau, caused the explosion. There is some colour given to this theory by the fact that Alton (1st fatal case) worked in Nassau in the same shop with two other carpenters, whose deaths from yellow fever were the cause of his removing to Bermuda.

Did he there contract the disease, landing in Bermuda with true tertian intermittent masking the more deadly enemy; or, did he, in his impaired state of health, after his recovery from intermittent, contract yellow fever in Bermuda? To neither of these questions do I feel myself equal to reply, although I am inclined to the former belief. On the other hand, why did not other passengers by the same vessel, and more exposed in Nassau, contract the disease? Some went to Savannah and other places favourable to the development of yellow fever, having remained in Bermuda for a very brief period, and yet not one of these has been attacked.

Where did Williams (2d fatal case) contract the disease, seeing that he was 45 days from Nassau and 34 from Wilmington, when no yellow fever was there? Did he also carry in his system the poison from Nassau? I confess that the question, a vexed one, is beyond my powers.

9. *Vide* answers 3 & 4.

10. The overcrowding of the town and vicinity of St. George's, together with the notoriously debauched habits induced by high wages, cannot but have acted prejudicially on the general health. Almost every house, overcrowded to an incredible extent, served *pro tempore*, as a lodging-house. Even thus there was not sufficient accommodation, and exposure to the night air in consequence quickly developed, in men of debauched and intemperate habits, the latent seeds of disease.

11. The harbour of St. George's was considerably crowded at the commencement of the epidemic. There has been no change in its general sanitary condition, except the abolition of two slaughter-houses: the one on Market Wharf, the other on Johnson's. An offensive old hulk, also, adjoining Market Wharf, was removed immediately before the epidemic. The sanitary state of the shipping was, as a rule, good, but some instances occurred of overcrowding and neglect of cleanliness. Cases of fever, as they appeared on board were removed to Pendle-hill Hospital, distant about 2½ miles west of St. George's. On the 27th August I visited, in company with a member of the Board of Health, 18 vessels in the harbour of St. George's, and from them had removed men attacked by fever. After this date all infected vessels were moored in the stream, and were not allowed to remain at wharves.

12. Yes, overcrowding was universal.

13. For account of the screw steamer "Fannie" *see* answer No. 8.

Brigantine "Apus." (*a*) Brigantine "Apus," from Nassau, N.P., arrived in Five Fathom Hole on the 29th June, having had one death from yellow fever on the passage. I placed her in quarantine, and finally sent her on the 6th July to Quarantine Island, in the Great Sound, where, her crew and passengers landing, were further detained, and the vessel cleaned and fumigated. Barque "Mary." No fresh case of fever occurred whilst in quarantine. (*b*) Barque "Mary," from Nassau, arrived in Fathom Hole on July 5th, having also had one death on board during the passage from yellow fever. She remained in quarantine until the 9th July, when I induced the captain to sail for St. John's, N.B., taking with him all his crew and passengers and Bermuda pilot, none of whom had been allowed to land. No fresh case of fever appeared whilst she lay in quarantine. After this period, and during the epidemic, almost all the blockade-running steamers plying from Bermuda and Nassau were infected, having carried the disease from this port or Nassau. My information is derived from personal observation as health officer.

14. I cannot say.

15. I think not. I do not consider that the health of the community was in any way influenced by the state of the beaches and foreshores.

16. As in former years, rain water, collected in tanks from lime-washed falls. I cannot even conjecture the amount. The quality, as far as I have observed, has been for the most part good and wholesome; but in some instances I have noticed a vast quantity of mosquito larvæ, and a considerable trace of organic matter.
Supplied by agents in water boats.
Water obtained from tanks about the vicinity of St. George's and Bailey's Bay.

17. I cannot say.

18. Nuisances were removed; the quarantine regulations were more strictly enforced, and a hospital opened for the treatment of sailors and others.

19. I append a table, extracted from my private diary, showing the range of the thermometer, and the direction of the wind. The observations were taken daily at noon. The thermometer hangs in my quarters.

20. The total abolition of cesspits; a new system of drainage and water supply; as I cannot but think that, owing to the close proximity of some tanks to the cesspits, the sewage must percolate through the porous soil, and thus taint the water.
By draining the pond at Fort Cunningham Island, and clearing between it and the fort, the camping ground might be increased, and the site rendered more healthy for troops.
The streets, also, should be raised, to prevent the water lodging; and the houses should be better ventilated. I would also suggest the appointment of a sanitary director, and the erection of huts on Non-such Island, as a permanent quarantine station; and that all vessels arriving from ports within the "yellow fever zone," between 1st May and 1st November, should be examined before entering the harbour, and, if expedient, be detained under quarantine of observation.

(signed) *B. Burland*, M. B.,
Assistant Surgeon, R. A.,
Health Officer, East End.

St. George's, Bermuda, 1 June, 1865.

APPENDIX (A.) to Dr. *Burland's* Answers.

STATEMENT of *John Tucker*, and his Sons, *Henry* and *Christopher*, taken on Board Steam Ship "Agnes E. Fry," 20 and 21 October 1864, taken by Dr. *Burland*, R. A.

1. *Henry Tucker* (coloured), states:—I live with my father John, and brother Christopher, near the Devil's Hole, at Harrington's Sound. Was attacked on Sunday, 19th June, with headache, vomiting, pains in the limbs, &c.; was very sick. Dr. Outerbridge attended next day (Monday). Was in bed; had been working with my father at West's Wharf. Had not been for a very long time at Fisher's Wharf. Was not at any time on board the steamer "Fannie." About a week before, had been on board the steamer "Index," from Wilmington. Did not have any communication with the men, &c. of the "Fannie." My father, brother, and myself, always return and sleep at home, except when at night work, coaling. We then work all night and day; brother Christopher sleeps in the same bed with me, has always done so.

2. *John Tucker's* Statement.—Was attacked on the day after the horse races at Shelly Bay, 21st June 1864. Two days after son Henry felt ill at the races. Had been working with son Henry at West's Wharf. Had not been at Fisher's Wharf for a long time. Was not at any time on board the "Fannie." Might have been on board some other steamer, but not the "Fannie." A week before the attack, was very sick, and treated in bed by Dr. Outerbridge; slept every night at home.

3. *Christopher Tucker* (coloured), states:—Was attacked, after my father and brother. Do not know how long afterwards. Was at races at Shelly Bay. Had been working at Fisher's Wharf, wheeling coal on board a steamer; believe it to have been the "Fannie." Felt a headache whilst coaling her; was engaged coaling her one night and two days. Heard that the ship was from Nassau; heard it talked of. Saw two men lying below between decks, beside the hatchway; saw them whilst wheeling the barrow backwards and forwards, coaling the vessel. Do not know whether they were sick or not; heard they were; heard so from people about, who said it was fever; could not say whether they were stript or not; heard of no more sick on board. When taken ill did not go to bed; was not treated in bed during the whole period of attack; suffered from headache and pains in the limbs. Had an attack of fever four weeks ago (this was six weeks after the present attack he speaks of); was then obliged to remain in bed; was very sick. So quite sure the last attack was yellow fever.

(signed) *B. Burland*, M. B.,
Assistant Surgeon, R. A.

St. George's, Bermuda,
21 October 1864.

APPENDIX (B.) to Dr. *Burland's* Answer.

1. Written Replies of Mr. *Jervay*, Agent, of the Steam Ship "Fannie," and Passenger by her from Nassau, 13 June 1864.

"THE 'Fannie' left Nassau on the 9th June, arrived at Bermuda on the 13th idem; I cannot say of my personal knowledge that the fever was prevailing at Nassau during her stay. It was reported that there were a few cases. She arrived at Nassau from Wilmington 28th May. She was alongside the wharf in Nassau; only lay long enough to discharge her cargo; coaled at Hog Island, and from lighters. At the time of our arrival here, I knew of but one case of sickness during the passage from Nassau. This was an engineer, who was on the way to England, to take charge of a boat which was then building; he had had previously an attack of apoplexy, and was threatened with a return while on the passage.

"I have heard, since the 'Fannie' left for England, that one man was landed from her (whether passenger or one of the crew, I am unable to say); he, I learn, has died, but was treated by Dr. Hunter for chills and fever, &c.

"2. There was no death on board the 'Fannie' during her passage from Nassau to this port. A passenger, who left Wilmington in her, died shortly after getting to sea. His disease was consumption, or some organic complaint. The physicians had no hope of his recovery, but advised a change of air, as the only means of averting immediate death.

"I have heard of no death during the passage to England."

(True Copy.)
B. Burland, M.B.,
Assistant Surgeon, R.A.

Dated St. George's,
7 October 1864.

Mr. Jervay concludes his statement, by saying, "No pecuniary consideration could induce me to be privy to the introduction of a pestilence which has spread so much suffering and sorrow over the land."

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2. Statement of *Thomas Bostock*, late first assistant engineer of the steam ship "Fannie," 22d October 1864:—"I am chief engineer of steam ship 'Caroline.' Left Nassau on 9th June as first assistant engineer of steam ship 'Fannie'; heard that yellow fever was in Nassau, but saw no case of it. Arrived at Bermuda 13th June; during the passage there was no sickness on board, except Mr. M'Kewan; was not aware that Alton was sick on board. Saw him frequently during the passage; he was a deck hand and worked his passage; he was by trade a carpenter. A case of sickness could not have been on board without my knowledge; there was no death on board. Mr. Jervay, Mr. Clarke, Mr. M'Kewan, Mr. Marshall, a Wilmington pilot, a Mr. Fitzgerald, of Savannah, and Alton, all landed and remained behind. Three firemen (do not know their names) deserted the ship; shipped three others in their place; 'Fannie' left on 15th June; lived on board all the time in port here; did not know or hear of any sick on board whilst in port. If anyone was sick on board must have known it; thinks it impossible for men to be in the place described by Christopher Tucker, during coaling; they would be choked by coal-dust; lower holds, fore and aft, were nearly full of coal on arrival here; balance of coal for voyage to England, filled up hatchway and portion of between decks; all the seamen shipped at Nassau sailed from Bermuda for England; none remained behind, no new hands except the three firemen, were shipped. A man died on the passage from Wilmington to Nassau; he came on board dying. States positively that there was no sickness or death on board the 'Fannie,' after she left Bermuda; arrived in her at Greenock, about 28th June; left her 1st July, all then well."

J. A. Fraser, late second officer, "Fannie," states (22d October 1864):—Am chief officer of the steam ship "Caroline," was second officer of the "Fannie," on her passage from Nassau here, on the 9th June. Alton was a deck hand and worked his passage; heard that Alton complained on board; saw him constantly, did not know of my personal knowledge that he complained; heard so, can swear that all the seamen who arrived here from Nassau left again in the "Fannie." No sickness or death either here or on the passage home; had there been, must have known it; arrived at Greenock in the "Fannie"; left all well; a passage between forecastle and "tween decks" was open; a man might lounge there and might not be noticed.

A man wheeling coals could not see another in that place.

Doubts Christopher Tucker's statement, corroborates Thomas Bostocks.

(signed) *B. Burland*, M.B.,
Assistant Surgeon, R.A.

St. George's, Bermuda,
22 October 1864,

ANSWERS of *Frederick A. Hunter*, Esq., M. D., to Questions, No. 1.

1. Frederick Augustus Stewart Hunter, St. George's, physician, practising 15 years in Bermuda. I am the person referred to at p. 55, Report of former Commission, 1853, as Dr. Frederick Hunter, placed in charge of the troops sent to Ports Island.

2. The health of the Colony generally, from the commencement of 1864, had been much as usual, both among the civil population and the mercantile marine. My practice is, and during the epidemic was, almost exclusively among civilians during a crisis, and for the short period of 10 days I was able, with great difficulty, to devote some portion of each day to assisting the insufficient staff of military medical gentlemen in their labours, but I do not consider that, under the circumstances, any information I then derived or observations I made, would be of very considerable service to the Commissioners.

3. None.

4. None.

5. The endemic diseases of the Colony are pretty generally spread over its surface; the yellow fever sprung from an obvious centre, and ramified. Where it prevailed, no particular concentration of endemic disease had been observed.

6. *Symptoms.* The attacks commenced with constipation, nausea, and vomiting, rigors, frontal pains, pain in the back, very often extending down the calves of the legs, pain across the epigastrium, hot burning skin, high fever, pulse quick and bounding; tongue pasty, white, and tremulous; suffused eyes, with a peculiar appearance very difficult to describe, but only too well known, especially in latter stages, as a fatal symptom, to all who are familiar with the disorder.

In some cases, after the first or second day, diarrhœa, which I do not consider a favourable symptom; great central excitement, delirium, and after the second or third day, great restlessness and insomnia in many cases; about the fourth to the seventh day, retention of urine, and very often suppression, a most fatal symptom, accompanied about the fifth day by black tarry stools, very often resembling the black vomit ejected from the stomach. After the third or fourth day the skin begins to assume a yellowish tinge, in most cases deepening in its intensity up to and after death, but I do not consider the tinging of the skin a fatal symptom by any means. About the fourth day, especially in cases about to prove fatal, a great desire to rise from bed. Fatal cases generally terminate on the sixth or seventh day, but I have seen much shorter and some longer cases, even extending to the 12th day.

The final symptoms are constant retching, the ejection of a dark flaky fluid, much resembling coffee grounds. Hœmorrhage in some cases from gums, nose, and ears; tongue dark, dry and brown; hurried breathing, cold clammy skin, a sinking pulse. In some cases the patient dies very quietly, particularly in those of suppressed urine, where death generally supervened in a state of coma; in other cases there is a severe final struggle.

A peculiar odour from the body during the whole attack could invariably be detected on entering the house where the patient was.

Pathology. Yellow fever poison, whatever it may be, and in whatever way introduced into the system within, by miasma or otherwise, directs its attacks primarily on the mucous membrane of the stomach and bowels, gradually effecting a complete disorganisation of it. A case occurred on board the blockading steamer "Flamingo," in harbour, where I distinctly recognised the disorganised mucous membrane as ejected from the stomach by a sailor who died an hour after. I also observed, in the case of a southern gentleman, the lining of the intestines passed by the bowels in strips, ending like the former cases in death shortly after.

I have, to the best of my experience, and under the disadvantage of such a constant and unremitting occupation of my time, day and night, during the whole epidemic, in the active duties of my profession, as left me not a moment of time to make any notes, detailed the symptoms and pathology of this terrible disorder, but I wish to add that, in my opinion, it is next to impossible to lay down any one rule or describe any one type for use; no disorder, I know, admitting of so many variations and gradations as yellow fever. In the same house, ward, room, I have seen every degree, from the very mildest to the most malignant, concurrently.

7. In no respect, except that the epidemic of 1853 was more malignant in type.

8. 1st *Case.*—A man of the name of Alton, a passenger in the blockade-running steamer "Fanny," which arrived from Nassau on the 13th of June, came to me on the 18th of June, complaining of chills (tertian type). I prescribed for that peculiar form of fever, and met him a few days afterwards on the Ferry-road, expressing himself perfectly cured. On the 23d he again applied to me, with suspicious symptoms, which I treated as for yellow fever, and attended him up to the time of his death, which occurred on the 30th. In the course of his illness I communicated with Dr. Burland in charge of the Artillery, and Assistant Surgeon Everet, in temporary charge of the 39th Regiment, with a view of warning them of the presence of this disorder.

I, at the same time, took every means in my power to prevent, as far as possible, all communication between the people of the house and neighbours, and, on Alton's death, directed all clothing, &c., used during his illness, to be buried. The house in which Alton was taken ill lies on the hilly range which encircles the town of St. George's on the north, and in a depression of that range between Fort George, on the west, and the house of the Honourable Augustus Mallow.

The ground is rocky, with a few stunted cedars; it opens to the sea on the north, and the house is isolated from other dwellings.

2d *Case.*—George Williams, a seaman on board the blockade-running steamer, "City of Petersburgh," arrived from Wilmington on the 10th of June; remained on board his vessel until the 24th of June, when he came to lodge in a house situated on the side of a hill westward of the town prison, and separated from the latter by the main road; with the exception of one other house standing close by, it is isolated. He was taken ill on the 10th July, and died on the 17th. The house was distant nearly a quarter of a mile from that in which Alton lodged, but the result of particular inquiries which I instituted was, that no communication whatever had taken place between the inmates of the two.

3d *Case.*—The third case occurred in a house near the Wesleyan Chapel, about 300 yards from the gaol. I was called in to attend the case on the evening of the day on which Williams died; the man was dying when I came to him.

After this, on the 16th July the fever began to attack the garrison, and rapidly spread among both military and civilians, and all over the town and neighbourhood.

It is worthy of record, that out of 17 cases which occurred in the town prison not one terminated fatally. I attribute this strictly to the regularity of the diet, the impossibility of obtaining spirituous liquors, and non-exposure to night air; 10 of these were Europeans, and seven natives.

My observation having been, with the exception before mentioned, exclusively among civilians, I have not troubled the Commission with any replies on heads (B.) and (C.)

9. The atmosphere had been for a considerable time previously in a very dense and oppressive condition; there were evidences of the presence of great moisture, and in general, it appeared to be in so unwholesome a state as to induce me to mention to Dr. Franklin, P.M.O., Dr. Burland, Dr. Everet, 39th Regiment, my conviction that fever would speedily develop itself, an anticipation which, in a few days, was verified. Other predisposing causes will be found in my answers to the subsequent questions.

10, 11, 12. No doubt the additions referred to exercised a serious influence on the general health of the town. The additions to the shipping, consisting chiefly of vessels engaged in the blockade-running trade, and consequently each carrying a larger number of hands than usual, and the trade in question having attracted large numbers of strangers of all grades to the town, the natural consequences were, the constant presence in the streets of crowds of seamen indulging in gross habits of dissipation, numbers of whom spent their nights sleeping in the open air; a vast increase in liquor shops, the conversion of every available dwelling, and every room in it, fit or unfit, even old hulks into lodgings, and the immediate and constant overcrowding of these. The demand for provisions of all kinds increased enormously; meat, in consequence of the high rate of wages, being freely and generally used. The slaughter-houses, therefore, all of which were then within the town, were in constant requisition, and as they, in common with privies and other outlets, drained into the harbour, in which there is very little current, there was a pretty constant presence of floating blood, offal, and other offensive matter, mixed with sea-weed, floating lazily past the wharfs.

13. As far as my personal observation went, I know of no ship that arrived in Bermuda during the year 1864, with yellow fever on board, though I had heard of such from the health officer. All the very numerous cases which I attended on board shipping in the harbour, or at Murray Anchorage, commenced after the arrival of the vessel.

14. None, whatever. The new Sanitary Act of 1864 did not come into operation until late in the year, and after the sickly season had began to pass away, about the month of October.

15. Answered above.

16. Nearly the entire water supply of the islands consists of rain-water collected in tanks. The great increase in the amount of shipping caused a corresponding increase in the demand for water; and during the whole of the sickly season the supply in St. George's was short; water was brought in water-boats from different parts of the islands to supply the shipping. As far as my observation extended, what supply there was, was pure in quality.

17. As far as my observation extended, none of these exercised any influence on the general health of the islands.

18. With exception of occasional visits from the Board of Health, and the removal of some ships and stationary hulks from the wharfs into the stream, none. A local Act prevented the erection of wooden buildings within the limits of the town, which extend to a considerable distance into the country east and west, and from shore to shore, north and south. It was constantly urged to modify the above Act to the extent of permitting the temporary erection of wooden dwellings or shanties for sleeping-places; there were fir trees in plenty, but nothing was done.

19. The entire absorption of my time, night and day, prevented my keeping any such record.

20. Some of the most obvious sanitary improvements have been already effected by the Sanitary Act of 1864, and certain improvements in progress in the streets will ameliorate the ventilation, but the drainage remains in a deplorable condition; in fact, there is no drainage at all. An effectual system for the whole town is loudly called for as a prominent sanitary measure.

(signed) *Frederick A. S. Hunter*, M. D.,
St. Georges's, Bermuda.

14 June 1865.

ANSWERS of *Alexander Crosbie*, M.D., M.R.C.S.E., Assistant Surgeon, R.N., Her Majesty's ship "Terror."

2. The general health of the civil population of Ireland Island, and of the crew of Her Majesty's ship "Terror," more immediately under my charge, seemed, on the whole, good during the period adverted to, with the exceptions to be made in reply to Question 3.

3. Disorders of the gastro-enteric system (colic, diarrhœa, and dysentery) were very common, and there were occasional cases of endemic febricula.

4. From an epidemic of Denque, or Breakbone Fever, which we experienced in 1863, a series of cases of febricula connected the termination of that epidemic with the outbreak of yellow fever in August 1864. The symptoms, pathology and geographical distribution, I regard as alike, in fact, as mere varieties of the same fever.

5. As far as I observed, the localities of the fever were exactly the same as those of the usual endemic fevers, only more widely spread.

6. The symptoms consisted in pains across the loins, wandering in the limbs, severe frontal headache, pains in the eyeballs, ferretty redness of the eye, hot and dry skin, soon becoming moist, thirst, furred tongue, anorexia, nausea with vomiting, first of mucous then of bilious fluid, sometimes copious, black vomit in bad cases, high pulse (80 to 130), scanty urine, or actual suppression. The pathology was that of an acute blood disease, resembling glanders or poisoning by putrid matter injected into the blood.

7. I have no experience of former epidemics, but, from what I have read on the subject, I should say that that epidemic did not.

8. The first case that presented itself to me among the civilians of Ireland was that of a boy named Tine, residing on board the hulk "Tenedos," in the Camber, on the 16th August.

The first case among the troops occurred, I believe, on the 12th August. In the "Nettle" gunboat on the 20th August. In the "Spitfire" on the 27th August. In the "Terror" on the 28th August.

The first-mentioned, Tine, had come from St. George's on the 13th in good health, and seemed labouring under mild fever, but he died on the morning of the 17th with profuse black vomit and insensibility. The fever appeared among the marines on the 22d August, and among the seamen of dockyard on the 28th. The boy mentioned above was, I believe, a native born of English parents, and the next two cases were of similar description. The others mentioned were of English origin, and they had been some time in Bermuda.

9. For two or three days preceding the outbreak, the temperature was high, there was little or no wind, and the air was loaded with misty vapour obscuring objects at a distance, and rendering the atmosphere insupportably hot and oppressive.

10. Of the conditions implied in Question 10, I have no means of judging, as the blockade running had no effect in this part of the island.

11. The Camber did not differ from the usual condition of cleanliness in which it always is, and there were fewer ships in harbour than usual. The sanitary conditions of the port were very satisfactory.

12. The dwellings of civilians were not overcrowded, and the population was the same as in former years, undisturbed by increase of shipping in other parts.

13. The steamer "Fannie," engaged in the blockade-running, left Nassau on 9th June, and arrived at St. George's on the 13th June; several cases of fever had occurred on board, but the evidence is insufficient to show that the fever was yellow fever, though this has been attempted.

14. I have no information to enable me to give an answer to this question.

15. The shallow water around the shores in this part of the island were more charged than usual with minute molusca and radiata, and the tidal surface emitted emanations easily detected by their peculiar faint nauseous smell, especially at night. These emana-

tions repeatedly produced diarrhœal and dysentric complaints on board this ship ("Terror.")

16. The water supply of the civil population here is collected from the roofs of the houses, or in tanks adjoining the houses, as is usual all over the islands. The quantity was ample and the quality good, unless obtained from tanks situated under the basement of those houses from which the water was collected from the roofs; in this case the water was impure from surface drainage. The shipping was supplied from the Royal Naval Dockyard, and the quality was good.

17. The only special local condition within my experience which influenced the health of the troops, and others situated within the sphere of the same condition, consisted in a surface unprotected by trees, or only by scanty vegetation, from the hot rays of the sun, in addition to the causes mentioned.

18. The working hours of the labourers of the dockyard, and of the men of this ship ("Terror") were shortened, cleanliness was enforced, exposure to the sun discouraged, bedding was frequently aired, and, where exposure to the sun was necessary, awnings were provided; quinine was given twice a-day either in simple solution, or in diluted rum.

19. I have no meteorological data to furnish, in answer to Question 19.

20. The only special condition to which I can refer as likely to improve the health of the islands, and diminish their liability to fever, would be to protect the surface of the soil as much as possible from the direct rays of the sun, by the planting of trees where vegetation is scanty or wanting. The reclaiming of swampy grounds, and the adoption of general or local sanitary measures universally allowed to influence the health of countries and localities, would doubtless improve the general health, and likewise guard against the prevalence of epidemic diseases.

ANSWERS of Surgeon Major *Cogan* to Questions, No. 1.

1. Francis Cogan, St. George's, Bermuda, Surgeon Major, 2d Battalion, 2d Regiment. Since May 1850 in different parts of the world, particularly in Ceylon for more than eight years.

2. Yellow fever had already made its appearance in Bermuda on our arrival from Gibraltar in July 1864. Previous to the outbreak of fever I have heard that the health of the island was very good.

3. Not being in Bermuda, I cannot answer, but on inquiry, I have heard that no type of fever or any other disease prevailed.

4. Answered in No. 3.

5. My practice was almost entirely confined to St. George's, among the troops, and yellow fever presented itself to an alarming extent.

6. When first attacked, the patient complained of pain in the head, particularly across the brows and eyes, pain down the back and all over the body, with great languor, a hot burning dry skin, tongue generally dry and parched, and varying in colour according to the attack. In dangerous cases the skin continued hot and dry, the urine became scanty, or entirely suppressed, and bilious vomiting would first set in, terminating in black vomit, and the skin and conjunctive presented all the appearance of jaundice.

7. The epidemic of 1864 was the first I ever experienced.

8. The first case of yellow fever that came under my notice occurred to a sergeant of the 39th Regiment, who was taken to hospital suffering from it, two days after the arrival of the 2d Queen's. There was nothing in particular about the history of this man's case.

I have been informed that the epidemic existed among the civil population previous to the arrival of the 2d Regiment in July 1864.

9. The yellow fever had already made its appearance in the island before my arrival in July 1864.

10. I consider that the addition made to the shipping and population exercised great influence over the general health of the island, inasmuch as the houses and streets were overcrowded, and no sanitary precautionary measures taken in most of the houses and streets to prevent or mitigate the spreading of yellow fever.

11. The harbours were generally crowded, but I can say nothing particularly, in a sanitary point of view, against such crowding.

12. They were; some of the low lodging-houses were crowded almost to suffocation.

13. Two vessels arrived from Nassau, supposed to have yellow fever on board, previous

to the arrival of the 2d Regiment in 1864, according to the information received from the health officer.

14. Having arrived in Bermuda in July 1864 only, I am not aware of any improvements having been made in house drainage, or in the abolition of cess-pits; from their present appearance, I am led to believe that very few sanitary improvements have been made for a long time in the town of St. George's.

15. I am not aware that the water of the harbours were more than usually charged with foul or putrescing matter in 1864. The beaches and foreshores were in a good sanitary state, except along the wharfs, which were so much crowded with cargo, &c.

16. The water supply in the summer time is very limited: its source is rain water, collected in tanks, and these tanks are generally underneath the people's houses, which must act detrimental towards the health of the inmates. Its quality was pretty good, but occasionally it would become a little impure.

17. I have not observed any particular influence having been exercised over the general health of the island, or on the health of the troops by marshy grounds, swamps, creeks, or graveyards, but the very great deficiency of drainage, and the accumulation of soil, must interfere seriously with the health of every one in general.

18. The police were more on the alert, and all strangers, as it often occurred, taking ill with the fever in the streets or houses, were sent off to a civil hospital, about two miles from the town of St. George's, and towards the end of the epidemic cleanliness was more observed throughout the streets.

19. No meteorological data or observations kept during 1864.

20. The principal sanitary works which I consider the most needed in the different towns of Bermuda, is the erection of water tanks on an elevation above the town, to be supplied from the sea by wind mills or small engines, to flush the drains. The drains to be so constructed that they should not all run into one, to prevent too much of an accumulation at its exit into the sea. The police force should be increased, and instructions given to them, to prevent all refuse being thrown into the street, and to inspect occasionally the back premises of houses in crowded localities, that no accumulation of soil be allowed to remain longer than 24 hours, and that scavenger carts be constantly employed in removing such accumulations.

It is almost unnecessary to remark that the town of St. George's is far too much overcrowded with old dilapidated buildings, and all the streets too narrow; consequently the circulation of air is too limited.

F. Cogan, Surgeon Major,
2nd Battalion, 2nd Regiment.

(G.)

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Extracts from Answers of the Worshipful the Magistrates at Ireland Island, to Questions, No. 1.

14. Yes, so far as the dwelling-houses of the dockyard are concerned, considerable progress had been made in this respect, so that little or nothing more was required.

15. The waters, beaches, and foreshores of Ireland Island were cleaner in 1864 than in former years, owing to the absence of the convicts. There was, therefore, no foul or putrescing matter to affect the general health.

16. There was plenty of water for everyone on Ireland Island. It was rain water collected in covered tanks from the roofs of the store-houses, workshops, dwelling-houses, &c.

No restriction was put upon its use, everyone had as much as he required. Its quality was excellent, as regards purity. The same good water was supplied to the shipping requiring it there.

20. Boards of health, or other bodies empowered by the legislature to suppress nuisances, and to prevent over crowding in lodging-houses, or other places. The establishment of public water tanks in each of the corporate towns, and also in each parish (independently of the other), for the supplying of good water (under proper supervision), to the poorer classes; further, a legislative enactment (if it do not already exist), making it obligatory on each builder of a new house to construct a tank in connection with it, proportionate to the superficial extent of the roof.

EXTRACTS from Answers of the Worshipful the Magistrates of Sandys Parish, to Questions, No. 1.

8. The first case of yellow fever, occurring in Sandys Parish in 1864, was that of a young man employed as a clerk in St. George's, who being there seized with the premonitary symptoms of yellow fever, came up to his friends residing near Somerset Bridge. He, through the skill and attention of his medical attendant, together with good nursing, eventually recovered, but his sister took the fever from him, which terminated fatally. His mother (an English lady), also took the fever, but recovered. The young man and his sister above mentioned, were born in Bermuda, but both their parents were English. Many subsequent cases of fever which occurred in that locality can be traced to the above.

20. Her Majesty's ships of war, and our own merchant shipping, necessarily cause a continual intercourse to exist between our naturally healthy islands and other countries, in some of which, fevers and other infectious diseases are generated. This lays our islands liable to have fevers and other diseases introduced into them, notwithstanding the stringency of our quarantine laws to prevent it. When this unhappily occurs, the only check to the spread of such disease is by enforcing cleanliness before its appearance. The corporate towns of Hamilton and St. George are doubtless under the supervision of their respective police, who attend to their sanitary condition. The rural parishes have not these advantages. On the appearance of infectious disease, the constables, under the authority of the Board of Health, are sent to examine and report upon the state of the parish, in regard to cleanliness, when filth and other nuisances, should such be reported to exist, are ordered to be removed. We are of opinion that an examination of the sanitary state of the rural parishes should be made periodically, more especially before the commencement of summer; and that the constables, or others performing such service, should be remunerated for the same out of the public chest

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EXTRACTS from Answers of the Magistrates of Pembroke Parish, to Questions, No. 1.

8. The first fatal case of yellow fever in this parish, we believe, occurred at one of the hotels in the town of Hamilton, about the 4th of August last; one of the boarders at that hotel, a native of Baltimore, not connected with shipping.

EXTRACTS from Answers of a Committee of Vestry of St. Peter's Church, St. George, to Questions, No. 1.

10. Yes, to a very great extent the lower class of boarding-houses being over crowded by men from the shipping.

11. The harbour of St. George was very much crowded with shipping during the whole time of the prevalence of the epidemic.

20. We would recommend a good airy comfortable hospital, and a health officer appointed who would be always at hand, one who may be called on at any moment, and the strictest quarantine regulations kept during the summer months.

EXTRACTS from Answers of the Vestry of Hamilton Parish, to Questions, No. 1.

20. Churches, public buildings, hotels, &c., should be subjected to rigid inspection by some competent person or persons appointed by the Governor, and, reported on as to healthiness of locality, ventilation, adaptability for public resort, &c.; and, if reported on unfavourably in any or either of these respects, immediate remedial measures adopted. Cemeteries attached to churches, or near crowded localities, should, as soon as circumstances permit, be closed up. Interment in vaults, or cased graves, in a climate such as ours, should be prohibited. The reclamation of marshes or swampy ground we regard as of primary im-

portance in a sanitary view, and perhaps no better appropriation of the public money could be made than by offering a liberal bounty for each acre of such land which, in the opinion of competent judges, shall be deemed as being thoroughly reclaimed. In the event of the proprietor or proprietors of such land being unwilling or unable to undertake the work of reclamation, we think such lands should be taken up and purchased by the public, and measures taken for effecting such object. Such land when reclaimed would prove a source of public revenue, to say nothing of the far greater advantages which would undoubtedly result if legislative enactments were adopted for procuring the reclamation of all marsh lands in the Colony. No system for improving the health of the towns, we conceive, could be more judicious than providing for immediate and adequate sewerage or drainage, and ample supply of water. The erection of public tanks in the towns and thickly inhabited localities of the rural parishes, so as to ensure a supply of water in case of continuous drought. The prohibiting wharfs or other places within the limits of the townships from being used for landing lumber, cotton, coal, &c. Proper places on the contiguous shores or islands beyond the limits of the ports appointed for the reception of such articles. We are not prepared to state an opinion with reference to the improvement of harbours, beaches, or of sanitary police, but we cannot refrain from expressing our conviction, that if the salutary enactments of the Act of the Legislature of these islands, entitled "An Act to establish certain regulations for the performance of Quarantine," were rigidly enforced, the health of the population would in a great measure be guarded against the prevalence of epidemic diseases.

Extracts from Answers of the Vestry of Smith's Parish, to Questions, No. 1.

10. Yes, the great influx of shipping into the harbour, and great increase of population in the town of St. George, we think exercised a pernicious influence, combined with the crowded state of the wharves with cotton, coals, and other merchandise, which greatly obstructed ventilation in that small and confined town.

11. Hamilton Harbour was in a healthy state, not crowded with shipping, whilst St. George's Harbour was over-crowded with steam shipping and sailing vessels, laden with coals and other merchandise from Europe. At that time there were slaughter-houses in St. George's; and large quantities of damaged bacon was stored there.

Extracts from Answers of the Vestry of Devonshire Parish, to Questions, No. 1.

20. We are not aware of any sanitary works necessary for the improvement of the health of the islands. We would recommend a strict attention to cleanliness, and the removal of all articles likely to produce unhealthy vapours, and a rigid enforcement of the quarantine laws, and as before remarked, we do not consider our marshes unhealthy.

Extracts from Answers of the Vestry of Pembroke Parish, to Questions, No. 1.

20. We are not aware of any sanitary works necessary for improving the health of the islands. They are all narrow, and washed on every side and in every creek by the sea water. Rigid quarantine should be observed, and constant attention during summer to the removal of every thing putrescent, or likely to exhale unhealthy vapours, especially in the towns. In answer to Question 17, we stated that the marshes here are not considered prejudicial to general health, nor have we ever heard of fever originating at or near them. A measure of paramount importance is dispersion; that is, not to keep together a number of persons (soldiers in barracks or others) after a single suspicious case of fever has occurred. The many small islands here, some of them not inhabited, afford facilities for effecting this. As a proof that such insulation has been in Bermuda an effectual protection, we would mention that in the epidemic of 1864, and in a former year, seamen not allowed to go from their vessels have entirely escaped the fever. The steamer "Melita," 853 tons, 37 men, from Liverpool, England, lay in the harbour of Hamilton a considerable time during the epidemic last year, most of it within stage distance of a wharf. The master of this vessel adopted measures which effectually prevented his men from going on shore, or persons from going on board, the consequence was complete protection from the disease.

Extracts from Answers of the Corporation of St. George, to Questions, No. 1.

8. The first case that we are aware of occurred and terminated fatally on 30th June, at the house of Edward Walsh, situated at the North shore, and nearly an isolated position. The patient was an Englishman (a carpenter), and arrived in the steam-ship "Fannie," from Nassau, as a passenger, a few days previously. By direction of the Board of Health, a coffin

a coffin was procured, and the body taken to the Cemetery by a short road across Mr. Meepon's hill, without passing through the town (as is usual). The Coroner thought it his duty to hold an inquest, which caused the body to remain unburied for a much longer time than was necessary. The Board of Health caused the house to be vacated, the bedding, clothes, and even chest, of the deceased to be buried. The house was thoroughly fumigated with black manganese, salt, and sulphuric acid, and afterwards closed, with tubs of ice and salt placed in each room. The inmates were placed in tents, with both civil and military police in attendance to prevent communication. They were kept in this way for about 15 days, the house was thoroughly white-washed and cleansed by the tenants, without any communication with the town's people.

One of the inmates, a boarder of Walsh, was a white female of European birth, who subsequently had the fever during the prevalence of the epidemic in August. The second case that came to the knowledge of the Board was reported to the Mayor by Drs. Hunter and Lough, on the evening of the 16th July. A man by the name of Williams, in a house near the gaol and in the road leading to Walsh's, but some distance from it; this case terminated fatally on the morning of the 17th. The mayor took prompt action and caused the body to be buried immediately, the same course being taken with the bedding and house, as in the previous case, July 17th, 10 p.m.

The Mayor called on Dr. Hunter, and having been by him informed of a case in the blacksmith's shop near the hotel, and also of a suspected case on board the steamship "Lilian," reported the circumstance immediately to Major Pedder, for the information of the governor. At 2 a.m. 18th, the mayor was called on by Reverend Dr. Murray, who informed him that a man had just died in the road opposite the hotel; the mayor notified the coroner and Dr. Hunter. Dr. Hunter looked at the body, and informed the coroner that it was the man who was ill in the blacksmith's shop, and that he had died of yellow fever. The coroner handed the body over, and the mayor had it immediately taken to the cemetery at 3¼ a.m. Mayor summoned the Corporation as a Board of Health, and they met at 5 a.m. Mayor notified the Board of the suspected case on board the "Lilian," and also information he had received of a case of sickness on board brig "Caraccas." Committee of Corporation appointed to wait on Dr. Burland, health officer, the Mayor, Mr. Trott and Fox. The Committee called on Dr. Burland at 5.30 a.m., and requested that he would visit the "Lilian" and the brig "Caraccas," both of which vessels were suspected of being infected, and desired them to be removed from the harbour and placed in quarantine. At noon Drs. Burland and Hunter reported that there was a case of intermittent fever on board the "Lilian," and one on board the "Caraccas," and the Board presented to the view of Dr. Hunter a person lying under the verandah in the Market Square. The three patients were promptly despatched to the quarantine station at Darrell's Island, by Richardson's boat, no other place being within reach of the Board of Health.

EXTRACTS from Answers of the Reverend *Joseph F. Leghtbourn*, Rector of the Parishes of Pembroke and Devonshire, to Questions, No. 1.

20. Doubtless the drainage and cultivation of the marshes and swamps would be beneficial for general purposes. I do not consider that marshy lands and swampy grounds are injurious to health where there is verdure. Stagnant lakelets and pools may be deleterious. I have always thought that the marsh near Warwick might possibly be as hurtful as it is at times disagreeable.

It is said by an old author, "*in rebus dubiis plurima est audacia.*" I do not wish to confirm the maxim by any remark of mine; yet, with the respect for and deference to the opinions of others, I venture to say, that neither can I persuade myself nor be persuaded by any one, that yellow fever or any other epidemic originated in Bermuda.

EXTRACTS from Answers of the Rev. *Richard Thomas Tucker*, D.D., and Ecclesiastical Commissary for Bermuda, Rector of the parish of St. George, to Questions, No. 1.

10. Certainly they acted most prejudically by introducing or spreading the fever.

The shipping being crowded to excess, the blockade-runners reckless and abounding in money, the lodging houses and taverns became crowded beyond any possibly decent accommodation. The drunkenness, filth, and exposure by day and night, were in every sense alarming.

11. Ships not being intended for stationary habitations, when at anchor in a land-locked harbour, or at a wharf, assumed the character of sick-wards, or pest-houses, which could not be relieved until the establishment of the fever hospital at Pendle Hill.

12. The removal of persons from the crowded shipping to board in private houses, occasioned unhealthy closing up and partitioning of already confined apartments, and the reduction of every kind of convenience and comfort.

20. I think the erection of cottages to reduce the crowding of the poor in hovels and cellars, the dispersion and encamping of the military, the widening of the streets and lanes

of the old town, and a stringent enforcement of quarantine and sanitary police regulations, highly beneficial and necessary for a community which is brought into more frequent communication with infected ports, than was contemplated in former days.

In an island whose soil is so sandy that water cannot be retained on its surface, absorption into the earth would appear to be the proper mode of drainage. Any drainage into the harbour would be counteractive of all sanitary rules and principles. The removal of animal and vegetable refuse, and its return to the soil in gardens and fields, is on every account desirable, and the system of purifying the town by the periodical visits of the scavenger, adopted of late years, has been successful and beneficial in proportion to the extent to which it has been adhered to.

EXTRACTS from Answers of the Rev. *John F. B. Lumley Lough*, Rector of Hamilton and Smith's Parishes, to Questions No. 1.

5. From my own experience as well as from the published returns, I gather that a larger number of cases of yellow fever appeared in Hamilton parish, than in any other parish in Bermuda, in proportion to the population. I believe at the "Crawl" there was not a house where there were not several cases, many of them fatal.

7. I may perhaps be allowed to say, in answer to this question, that the mortality arising from the epidemic of 1864 was, in Hamilton parish, very much larger than in previous visitations, as shown by the parish register of deaths. For instance in 1843 the total number of deaths in the whole year was - - - - 26
In 1853 it was - - - - 16
In 1856 it was - - - - 19
In 1864 it was - - - - 52
of the last, 31 died of yellow fever.

8. Within my experience the first case of the epidemic of 1864 occurred at the Flatts. A young coloured man named Robert Dickenson, aged 24 years, had been at work at St. George's, and had received a severe injury in raising a bale of cotton. He came home ill, and died after eight or nine days with evident symptoms of yellow fever. He was buried on the morning of August 13th.

August 19th died Robert Dutton, aged seven years, son of Captain Dutton, an American who had charge of the wharf used by Messrs. Crenshaw, in St. George's. Captain Dutton's family had removed recently from St. George's to Shelly Bay, in Hamilton parish. August 20th, James Albany, a young coloured man, was buried. He had been brought to his home in Smith's parish, from St. George's, two days before, having been found in a state of insensibility, with all the symptoms of the fever then prevailing in St. George's. From this date the appearance of the epidemic became very general throughout Hamilton parish, and was prevalent, though to a less extent, in Smith's. I can scarcely recall a family in which there was not a case, and in most more than one.

10. I have no hesitation in stating my belief that the additions made to the shipping and population, and the peculiar nature of the trade at that time, exercised a material influence on the health of the parish of which I am rector. Nearly all the first cases and deaths were in families, some of the members of which were at work in St. George's, on board the vessels, or at the wharves where the cargoes were stored. The proximity of Hamilton parish to St. George's afforded great facilities to labourers and others for reaching the latter, and the large wages offered there tempted many of the inhabitants to leave their ordinary employments at and near their home, and resort to St. George's for the day or week, as they saw most to their advantage. In many cases the first symptoms of the sickness appeared in St. George's, and the persons were brought home ill. Of these other cases some occurred in the same family.

EXTRACTS from Answers of *Thomas W. Hunt*, Physician and Surgeon, Sandy Parish, to Questions No. 1.

2. The general health of the population in this district was not below the average; indeed, I do not remember a more salubrious season than the spring and summer of 1864, up to the month of August, when the yellow fever made its appearance. As regards the troops, the ships of Her Majesty's Navy, and the mercantile marine, I can say nothing.

6. The symptoms varied remarkably in different individuals, according to age, temperament, nativity, &c. In the European the attack was often sudden, the patient having felt quite well a short time before. Slight chills, with great weariness and prostration, pain in the fore part of head and eye-balls; pain in the loins and lower extremities; pulse rapid and small at first, afterwards broad and fuller, rarely hard or tumultuous; tongue moist, and covered with a creamy exudation which now and then presented streaks of a bluish or purple hue; this pasty appearance of the tongue was a never-failing symptom. Skin,

burning hot, sometimes dry, but as often exhibiting a clammy feel. In a few hours, or sometimes on the second day, there came on pain at the epigastrium, with acrid burning, and the patient would often complain of this distress more or less through the whole course of the disease. As the disease advanced, the face became puffy or bloated, and, in severe cases, the eyes would exhibit that peculiar winking so often seen in a man intoxicated. The skin and conjunctivæ assumed a dingy yellow about the third day, sometimes earlier, and generally we had at this stage, vomiting and much gastric disturbance; and when the disease proved fatal, which was generally on the third, fourth, or fifth day, singultus, hœmorrhages, suppression of urine, vomiting, the injecta thrown up with a gush, and, as Dr. Copeland expresses it, of inky blackness, resembling the juice of the cuttle fish. In this disease I could detect no distinct remissions. A few cases presented evening exacerbations. The bowels, if confined in the first stage, were easily moved by the mildest means, and subsequently would often become so relaxed that great caution was needed in the administration of medicines.

The poison, whatever it may be, acting on the blood through the medium of the lungs; destroys the crasis of this fluid, all the vital tissues become impaired, and the mucous surfaces of the stomach and alimentary canal in an intermediate degree.

7. It differed very materially from the epidemic of 1856 in many essential points. In the latter there were distinct remissions, with more marked exacerbations; in this, too, the type was more sthenic than in the fever of 1864. In the former all the functions were deranged in a larger number of instances, the bowels were more torpid, the skin was drier and diaphoresis more difficult to excite. It resembled more a severe form of bilious remittent, and, like this, it was not in my opinion contagious or infectious, and, in my practice, it was more virulent in its attack and more fatal in its results than the fever of 1864. The late epidemic was undoubtedly infectious, and herein it differed substantially from its predecessor, which I am confident was not so to any appreciable extent; and this leads me to the conclusion that different types of this fever produce different effects, one type being contagious, another non-contagious. Hence, also, we may account for that difference of opinion which has agitated the profession and the community at large for nearly a century with regard to the infectious and non-infectious character of this pestilence.

My experience teaches me that such as suffer from this distemper, if they recover, and have had the disease "well marked," enjoy an immunity from a second attack. In 1856, the first cases of the epidemic that occurred in the colony appeared in this district, among a family of young children who had been nowhere to contract it. That that disease was of local origin I had then, and have now, no manner of doubt. About 500 cases came under my view. Among the English residents who held situations at Boaz, and Ireland Island, and who had the fever of 1853, and who resided with their families in this parish in 1856, not one was attacked; they went about and nursed the sick, and when their own families were stricken down, as happened in several instances, the husbands acted as chief nurses, yet they all escaped. On the other hand, a few who had not suffered in previous years took the fever in 1856, and some died. So again, in 1864, I had occasion to notice that those who had had the fever in a severe form in 1856 were protected.

8. The first case occurred on the 5th of August in a young gentleman who was employed in a mercantile firm in St. George's. He returned home on the evening of that day with fever on him. He experienced a very severe attack, with vomiting, epistasis, &c., &c. Between the 14th and 20th I visited five children labouring under a low form of fever, with evening exacerbations; two of these lived in the next house to the first case, about 150 yards distant, the three other children nearly a mile distant. On the 28th, a sister of the first case contracted the fever, and died on the 4th of September.

On the 29th and 30th, three more cases occurred in the same district, in different houses, two native and one English; they were all females of 19, 16, and 12 years respectively; they had all associated with persons from St. George's, but had studiously kept away from the sick and the first house infected; they occupied cleanly dwellings, spacious and airy, and the persons themselves were "well-to-do." The five children alluded to occupied low, damp, ill-ventilated apartments, but they all recovered, as well as their richer brethren. No further case occurred until about the 8th of September, and after this date the fever made its appearance in different parts of the parish, particularly where there were children who had not suffered in 1856.

On the 16th September I began to receive patients at the temporary hospital, and from this date to the 12th October inclusive, 22 men were admitted from ships lying at Her Majesty's dockyard. What was the sanitary condition of these ships, I am unable to say. Two of them had arrived from England some weeks before laden with coal.

10. I consider the state of St. George's, overcrowded as it was with a filthy, reckless population, in consequence of the blockade, to have been the sole cause of the outbreak of the epidemic. There the first case appeared, whether brought ashore from a blockader or not; and it is a notorious fact that, long before the authorities would admit the existence of fever, it had been more than once stated in their local public journal that fever did exist. Whether the first cases were imported, or whether they originated in the town, it would be presumptuous in me (not living on the spot) to give a decided opinion, but, having had some experience as to how *ex post facto* cases are got up, I receive all such with due caution. It

will be remembered that the fever of 1856 broke out in two or three different parts of the island nearly about the same time. The first cases occurred in this neighbourhood (where the late epidemic first prevailed) on the 5th day of August. That eruption was predicted by some. The bays and naked strand, owing to excessive low tides, had their organic matter operated on by a piercing hot sun, which organic matter emitted its foul and poisonous emanations to the surrounding district, and it was here the fever first fastened.*

But, as usual, there were not wanting those who would make it appear that the fever of 1856 was brought to this neighbourhood by a young sailor who had lately arrived in a merchant vessel from the West Indies. Fortunately, for his peace of mind, he himself was seized with the epidemic, and had it in a severe form; his laundress, and the family with whom he resided, did not contract the disease until the epidemic became general, but even this did not satisfy the dissentients.

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* *See* Report on Fever Commission, 1856.

Extracts from Answers of *Frederick Rees*, Physician and Surgeon, in practice in Bermuda from 1840 to present time, with brief intervals, to Questions No. 1.

2. The sanitary condition of the civil population of the parishes falling within the range of my daily practice, was, up to the occurrence of cases of the severe kind of remittent fever, usually good.

3. As in former years of my experience, occasionally cases presented of a decidedly remittent type.

4. The relation between the cases referred to, and those of the epidemic of last year, I believe to be close and inseparable, differing in intensity only. The symptoms and pathology are identical. The number of cases and severity of each increasing with the progressive development of favourable circumstances and epidemic constitution of atmosphere.

Extracts from Answers of *Thomas C. Higgs*, Esq., M.D., R.C.S. Edin., one of the Health Officers of Bermuda, Fifteen Years a Practitioner in Bermuda, to Questions No. 1.

7. Yes, some were covered with an eruption very like prickly heat, others had spots like the petechiæ of typhus, and others blisters of matter over them; the two last varieties I noticed chiefly amongst the troops and cases I had in quarantine.

8. The first case I treated in private practice was at Hamilton, July 29th. This man arrived here from Nassau about the 1st of July, in a vessel that was quarantined on account of a death on board, of yellow fever. After his release from quarantine he lived principally in St. George's. He died August 2d. He was a foreigner, and had lately arrived at Nassau from Wilmington.

The second case. Foreigner lately arrived from Halifax, lived in St. George's a week, arrived in Hamilton August 2d, attacked with fever the 3d, and died on 8th.

Third case. Master of small schooner, sailing between St. George's and Hamilton, came up August 27th, and died August 29th.

In my practice, natives and foreigners were attacked equally. I do not think they had connection with the shipping.

13. On the 18th of July a man was sent up to the quarantine station from St. George's with yellow fever. He stated to me that he was taken off the ship "Lillian," which steamer had lately arrived from Wilmington, I think, and that he had been ill from port to port.

20. I would recommend a strict quarantine, every vessel arriving from Southern and West India ports should be boarded by a health officer, and, unless clean bills of health are produced, should be placed in a quarantine of observation.

Extracts from Answers of Dr. *T. A. Outerbridge*, of Hamilton Parish, Eighteen Years a Practitioner in America and Bermuda, to Questions No. 1.

2. Remarkably good; had not seen a case of typhus fever for a year or more, which was quite unusual, having treated a number of cases every year since I practised in the colony.

8. I was called on the 20th June to treat Henry Tucker, a coloured man, living in Mrs. Slater's cottage, in Smith's parish, and the following day his father was taken with the same disease. I believe these were the first cases in the islands; these men had been employed on West's wharf in St. George's.

13. I believe the steamer "Fanny" had the yellow fever on board when she arrived in Bermuda on the 13th June. The man Tucker said he had worked on board that steamer, and saw two persons ill with fever, as he supposed, on board of her.

Extracts from Answers of *Benjamin Henry Stamers*, M.D. L.R.C.S., Edin., of Paget Parish, Practitioner of Ten Years standing, of which four have been passed in Bermuda, to Questions No. 1.

20. I should say that, if it were practicable to drain the marshes, it would cause the islands to be less liable to attacks of epidemics of yellow fever. I think the indiscriminate cutting down of trees, which has been of such general practice of late years, has an injurious effect on the health of the islands; I think there are many sanitary measures which, if carried out, would greatly improve the health of the islands.

Extracts from Answers of *Inglis Lough*, Esq., Doctor of Medicine, to Questions No. 1.

13. No less than six steamers and one sailing vessel arrived from Nassau, where the fever was known to be raging, between June 13th and July 17th 1864, these being the dates between arrival of vessels with supposed cases on board, and death of undoubted case of yellow fever with black vomit, George Williams, July 17th 1864. Besides these arrivals from Nassau were 10 steamers from Wilmington, N.C., which latter port had daily communication with Nassau, N.P. My information as regards entries of vessels is derived from the Custom House, St. George's.

20. I would respectfully suggest quarantine of the strictest description during the summer months, towards vessels arriving from West Indian ports; every vessel from any part of the world arriving off Bermuda during those months, to be boarded by the health officer; the health officer to go on board said vessel, the crew and passengers to be mustered and inspected by health officer; the health officer to be a local medical man, known to be experienced in the diseases peculiar to the Western Hemisphere; and an efficient quarantine establishment. Widening the streets of the ports, great cleanliness in the houses, yards, streets, wharves, and waters of harbours; legislative enactments with regard to supply of water to every house, house to house visitation by sanitary police endowed with sufficient power to enforce the law.

Extracts from Answers of *Frederick J. Brice*, M.D., Surgeon Royal Navy, to Questions No. 1.

8. 1st Case.—Matthew Tynes, æt. 7, was brought from St. George's on the 13th of August and taken on board H.M. hulk "Fenedos," moored in the dockyard Camber. On the afternoon of the 16th, this child was attacked with yellow fever, and died at 2·15 a.m. on the 17th.

2d Case.—Frederick Grote, æt. 18, dockyard labourer, residing at Portland-square, was attacked on the 17th of August and recovered,

3d Case.—Wm. Can, æt. 18, also dockyard labourer, was attacked the same day, residing at No. 21, Victoria-row. This patient also recovered. The above patients all Europeans.

Extracts from Answers of Captain *Pullen*, R.N., in charge of Naval Survey at Bermuda, to Questions No. 1.

9. My experience is hardly sufficient to give an opinion further than the months of August, September, and October; indeed nearly to the end of the year the weather was particularly calm and still, in comparison with what it was the previous year at the same time.

10. I do, and the crews of the blockade-runners generally were in appearance a dirty, desperate set. These men, let loose on shore from their ships and crowded together in the low common lodging-houses, with their bad and immoral practices, was sufficient to exercise not only a prejudicial influence on health, but on the morals of those who at all came under their influence.

11. Bad. I should say from what I have witnessed, particularly St. George's, at the latter part of 1863. I have found in the course of my survey operations, several rotting, festering, dead cattle on its shores, four one day within an area, of at least 100 square fathoms, the stench from which was detected a considerable distance. Also long streams of coal-dust across the harbour, dirt and every sort of filth thrown overboard from the shipping, and streams of blood, which, I believe, came from the shore. And on one occasion, in the outer part of Hamilton Harbour, on one of the islands have I seen rotting carcases of dead cattle; and this isle got its name in the survey "Stink Island" from the circumstance.

What the sanitary conditions were I cannot say; but there was much crowding in St. George's, and many sick I believe landed from the vessels.

20. I would strongly recommend the town of St. George being opened out by widening the streets, and not that dense crowding of houses and population so prevalent. All the

underbush and rank vegetation cleared about and near the town, and thin out the cedars. Good drains established everywhere, and the mouths of them to terminate well out at the low-water mark, or beyond it, and there the filth would be certain of being carried off by the tide; means of obtaining a plentiful supply of water, not only for every use of inhabitants, bathing included, but for the shipping; flush drains, and use of engines in the event of fire. Indeed for that great necessary, where the supply so entirely depends on rain, it should be an established law that every house should have a tank of a size sufficient to hold water enough for the number of persons the house will accommodate. And in fact all the churches and public buildings might have one of large size attached for use of all in the event of drought, and to be the charge of some responsible body.

All privies and cesspools to be frequently emptied. A plentiful use of lime and the white-wash brush inside the house as well as out. Domiciliary visits to be frequent, and without warning, and fines inflicted for the non-observance of such rules as the sanitary commission have laid down. Swamps drained off and the mangrove trees cut down, those at het head of Hamilton Harbour certainly, and that branch might be filled in and recovered so far as the low-water mark. The harbour to be under strict supervision of a properly appointed officer, and heavy fines imposed for infringement of the Port regulations, particularly that of throwing overboard anything but water. Strict quarantine laws, more landing-places required, particularly at St. George's, and they should not be so crowded as they now constantly are, boats, &c. having discharged their freight or passengers to shove off clear. The wharves too to be kept clear and clean.

EXTRACTS from Answers of *James Henry Thies*, Esq., Mayor of the town of St. George, and President of the Board of Health of that town, to Questions No. 1.

13. On the day that the steamship "Fannie" arrived at Bermuda, F. B. Stacey, Esq., a merchant of Liverpool, informed me that a certain gentleman passenger by the "Fannie," from Nassau, in New Providence, had told him that yellow fever prevailed at Nassau at the time of the ship's departure for Bermuda, which information I immediately communicated to the Officer Administering the Government, and on the following day Nassau was proclaimed an infected port. F. B. Stacey in about two hours after giving me the information told me that the person from whom he obtained it requested that he would not make it known.

14. No improvement has been made in house drainage. Cesspits have not been improved or abolished since the epidemic of 1853 and 56.

15. The waters of the harbours were not, in my opinion, more than usually charged with foul or putrescing matter in the year 1864. The sanitary state of the beaches was of an ordinary character.

EXTRACTS from Answers of *Joseph M. Hayward*, Esq., Merchant, St. George's, to Questions, No. 1.

10. I do. The arrival of so many ships from southern ports, each with large crews' caused a brisk trade in washing clothes; most of these clothes were washed in the town in crowded localities. From the nature of the trade, the majority of the men employed in it were of reckless habits, addicted to intemperance, leading most licentious lives, and destitute of that attribute of health, cleanliness, all of which would exercise an unfavourable influence on the general health of the island.

11. Crowded at St. George. The steamship "Powerful" lost many lives, and was in a very dirty state; on the contrary, the steamer "Hawk" was remarkable for cleanliness, but suffered greatly during the epidemic. The shipping generally were far from being clean.

20. Believing yellow fever "to be imported," I would suggest a strict observance of quarantine regulations, and a careful examination of all ships arriving from southern ports between 1st May and 1st November; the establishing a good hospital under proper medical supervision for the reception of persons affected with yellow fever, small pox, &c., on any isolated position where ships may perform quarantine, and, at the same time, land their crews for the purpose of thoroughly fumigating the ship. Drainage and sewerage through the town; if the large supply of water that accumulates on the barrack square, vicinity of the mess, and prison and western redoubt, instead of its washing into the town could be arranged to flow to the north side, it would greatly facilitate the corporation in arranging sewers, &c. An Act to compel landlords to furnish tanks to their premises, and keep them in order, would also be a good sanitary measure.

EXTRACTS from Answers of *W. H. Gosling*, Esq., Merchant, Justice of Peace and Member of Assembly for Parish of Pagets, to Questions No. 1.

4. Yellow fever never becomes epidemic here until a few days before or after the first day of August, and disappears about the 31st December, except, of course, a sporadic case or two before or after.

9. An absence of the usual tropical rains, a total absence of thunder and lightning from the overcharged state of the earth with electricity, the low and dry state of the marshes, the prevalence of weather unseasonably warm and damp in the month of May, and cool, dry winds the latter part of July, increasing the evaporation greatly.

10. None whatever; and I firmly believe that an epidemic was never imported any more than influenza, but arises from a certain atmospheric and telluric condition combined; on the contrary, I have frequently known ships arrive with cases of yellow fever without its spreading.

14. Sanitary conditions but little attended to and sanitary improvement but little understood. Certainly no improvement in that respect since former epidemics, not even in Government buildings or hospitals as to extra accommodation.

15. I did not accurately observe this in 1864; in former epidemics I had satisfied myself that a species of decomposition was going on in the bottom about the shores in shallow salt water, a bubble of gas being easily descernible, slowly ascending to the surface.

16. Water exceedingly scarce, except among the very provident; it is caught in tanks, many of which were very low from the absence of the usual rains; it would probably be more impure when drawn near the sediment usual in the island tanks.

17. No influence by graveyards, but by swamps and creeks for reasons before stated; I must add that no residence is much more than a mile from the sea, and that well wooded places were comparatively exempt; deciduous trees being rare.

20. The same sanitary improvements as have been found serviceable in England for the prevention or mitigation of zymotic diseases. I do not think unless we could govern the atmosphere and the condition of the earth, and regulate the tides, that epidemics can be altogether averted, but they may be much mitigated by sanitary attention, such as avoiding excess, cleanliness of dwelling and person, sleeping on upper floors, supply of pure water, dispersing bodies of men in small detachments to places not previously occupied, &c., &c.; drainage into the sea I would warn against, as refuse left on beaches, or even deposits, are fruitful sources of aggravation to epidemics which occur at a high temperature.

EXTRACTS from Answers of *Morris A. M. Frith*, Esq., J.P., Police Magistrate, Hamilton, to Questions No. 1.

5. Yellow fever prevailed generally in my neighbourhood; one or two families, and in some instances, one or two members of a family only escaping its attack. This circumstance seems peculiar to this disease, the same having come under my observation during the fever of 1856.

7. I noticed that the exhalations from the bodies of the patients were very perceptible and offensive, which was not so much the case in the epidemics of 1843-53 and 56; and that the fever of 1864 was more sudden in its results, than the fevers of former years. I would add, that it has been stated from a most reliable source that the epidemic of 1864, was the same fever which was then prevailing in Wilmington, N.C., and in Nassau, Bahamas.

20. That all vessels arriving in Bermuda between the months of May and November, in every year, from any port where yellow fever has been known to have prevailed, should be visited by the health officer before allowed to enter any port, and if deemed requisite from any circumstance, should be placed in quarantine, and there kept until allowed by that officer to be discharged. A strict observance of quarantine.

The sanitary measures already provided for under Act No. 15, passed by the Legislature in 1864, if properly carried out would, in my opinion, have a most beneficial effect.

The Legislature by offering a premium for every acre of reclaimed marshy land, may have some good effect.

EXTRACTS from Answers of *Ralph Higinbotham*, St. George's, Pharmaceutist, to Questions No. 1.

10. Undoubtedly the class of people, added to our population, was composed chiefly of the lowest sort. Intemperance was universal among them; cleanliness and the ordinary principles of decent living, seemed utterly disregarded. I have repeatedly seen some of

these people lying about the streets insensible from the effects of liquor, sometimes half-naked, and exposed to the rain and the hot sun. With such material to work on, it is no wonder that the fever raged so violently.

12. Not in my neighbourhood; but I have reason to believe that the houses to which the crews of vessels and the negroes resorted, were unusually crowded.

15. I do not know much of the condition of the harbours during the epidemic, but towards the end of the year a slaughter-house was erected which discharged its offal into Mullet Bay. There being no current nor outlet to this bay, much decomposed matter is likely to be retained in the harbour, and to prove detrimental to the public health.

20. I can suggest nothing better than the strict enforcement of the Amendment of the "Act to establish certain Regulations for the Performance of Quarantine." This Act appears to include all the requirements necessary to preserve the health of the towns; but, as I believe, yellow fever has never originated here, being in each instance spread amongst us from abroad. Our preventive measures should be directed primarily to the proper inspection of vessels arriving from suspected ports. Each quarantine station, which should be in the most isolated position possible, should have an hospital attached, to which the whole attention of an experienced surgeon should be directed; thus affording the chance of detaching and confining disease to certain limits.

(H.)

ANSWERS to Questions No. 2, received from—

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ANSWERS of Colonel *Hamley*, Commanding Royal Engineers.

1. I do not regard the barracks themselves, nor the space immediately surrounding them, as having in any degree influenced the health of Her Majesty's troops.

2 From 600 to 1,000 feet. I am not prepared with the exact calculation for the period named.

3. Louvred ventilators on the roofs, and ventilating openings in the walls and under floors. But the above means were not universally in use. In some cases the doors and windows were the only means; and this applies particularly to the casemated keeps of the forts. The air at night was tolerably pure.

4. The barrack latrines in the command are of defective construction, being, with few exceptions, placed over cess-pits. Their condition was as good as such an arrangement in this country admits of. Nuisance was and is occasionally experienced from them.

5. The water supply was good and abundant. Each man probably consumes about five gallons. I do not believe that the health of the troops was in any barrack influenced by the water.

6. It did. There was a great deal of drinking from September 1863 (the date of my joining the station) up to the outbreak of the epidemic.

7. I think not, except when the exposure resulted from a visit to the town of St. George, or some infected district.

8. The hospital accommodation at St. George's was and is inadequate. The hospital will only accommodate 23 patients properly. At the time of the greatest crowding the cubic space per patient was about 500 feet.

9. Good at first; but as the epidemic advanced the wards were overcrowded, and the water scarce.

10. The 2d Battalion 2d Regiment did not go into barracks at all. Such of the Royal Artillery and Royal Engineers as were in barracks at St. George's vacated them on the 14th August. The 2d Regiment head-quarters moved from camp at the Naval Tanks to Camp Ferry Point, 1st August.

11 (*a*). 2d Regiment, Naval Tanks, Ferry Point, Boaz Island, Royal Artillery, Fort Cunningham, Royal Engineers.

(*b*). Can be ascertained from the returns of corps.

(*c*). Officers' marquees, bell tents for soldiers, hospital tents, iron bedsteads, barrack bedding, wood floors.

(*d*). Three men per bell tent, and cubic space per man 159 feet.

12. It did not arrest the fever.

13. 9th September :—

Field Officer	1
Captains	2
Subalterns	5
Sergeants	12
Drummers	4
Rank and File	185

23d September :—

Subalterns	4
Sergeants	3
Drummers	3
Rank and File	182

One or two died on passage, and a few had fever at Halifax; but, on the whole, the effect was salutary.

14. The 2d Battalion 2d Regiment, as has been said, never took possession of the barracks. The barracks, at first, were constantly cleaned and whitewashed, and the cess-pits emptied. After a short time the troops vacated the barracks.

15. About the middle of August. I cannot state the numbers. My impression is that, except in regard to hospital discipline and to relapses occurring from breaches of it, the result was satisfactory as compared with those cases treated in hospital.

16. Treatment by stimulants, in the early stages of the fever, appears to have been unsuccessful. Great care, constant watching, avoidance of chill, and very little medicine, seem to have answered best.

17. Royal Artillery and Royal Engineers, 1862; 2d Battalion 2d Regiment, 1864.

18. I cannot.

19. As I have before said, I believe the barracks to be wholly guiltless of the late fever. Improvements in plenty are necessary on general grounds, and many of these have been already recommended; such as drainage of the town of St. George and of all the barracks, increased accommodation for officers and men, and for the sick.

Although I have thought anxiously on this subject, and have had the best opportunities of acquiring information, I have no suggestion which I can with any confidence put forward. It is a disputed point, whether the fever is brought hither from beyond sea, or whether it breaks out in the Colony. If the former, quarantine regulations are the remedy; if the latter, I may safely say that means of prevention are unknown. Ordinary sanitary precautions are, of course, advisable; such as draining, flushing, ventilating, and preserving dwellings from damp. I think the Bermuda slate an objectionable material for roofs; and I think that the soft stone of the islands should not be used for dwelling-house walls, unless they are lined with brick.

ANSWERS of Lieutenant Colonel *Rose*, Commanding 2d Battalion 2d Queen's Royal.

1. The battalion under my command was encamped, and for the most part removed from the proximity of the barracks during the epidemic, and consequently were not much affected by the impurity of air in and around the barracks.

2. Encamped.

3. Ventilation in tents good.

4. The drainage was good, but there is a defect at the end of the drain. A sort of trap-door should be placed there to prevent the foul air being blown up to the barracks. The latrines and urinals were not in use, the troops being under canvass. A very great nuisance existed from the extremely bad drainage of the officers' privy.

5. Rain water alone is used in the islands. It is generally good, but the quantity depends upon circumstances. The quantity used by each man is unknown. There was no deficiency in this respect, the supply being unlimited.

6. As a body, the men were temperate. Intemperance prevailed in St. George's to some extent during the epidemic, and beyond what is ordinarily the case.

Numbers punished, about	110
Admitted into hospital	1

7. Certainly.

8. The cubic space in the hospital for the 2d Regiment would have been sufficient during the epidemic, if half of the building had not been handed over to the Royal Engineers and Artillery. There was much overcrowding from this cause.

9. Ventilation in hospital appears almost perfect. There are windows in front and rear of the building; doors and ventilators on a level with the floor, and also on the roof. Drainage pretty good. Water supply limited, but deficiency supplied by means of carts.

10. Replied to in Pars. 1 and 2.

11. St. George's:—
At Naval Tanks, from 16th July to 30th July, 290.
from 30th July to about 9th August, 60.
Afterwards encamped in rear of Royal Barracks, but were shortly removed to the north shore.
At Ferry Point, from 1st August to 24th January 1865; average number, 260.
At Boaz Island, from 16th July to 9th September, 380.
from 9th September to 23d September, 179.
from 9th September to 9th January, 128.
Number in tent, 3.

12. The men not having been quartered in barracks, it cannot be judged. There is every reason, however, to suppose it was highly beneficial.

13. On 9th September, 201.
On 24th September, 50.
The effect was good.

14. The usual care was taken to preserve the cleanliness of the barracks handed over; but no decided measures could be undertaken.

15. At Ferry Camp, 1st August.
At St. George's.
Sick not encamped at Boaz.

17. 15th July 1864.

18. None.

19. The removal of the head-quarters of the 2d Regiment to Ferry Point was beneficial in the highest degree. This site would appear, from all circumstances, to be well suited for a sanitary camp; and I should, therefore, suggest the erection of a building, however light in construction, to serve, as far as possible, in case of need, as an hospital. The want of one was a source of considerable difficulty during the last summer, when a shelter, even for cooking food, heating hot water quickly, &c., was of great moment. The officers' quarters and sergeants' mess-house in St. George's are evidently so faulty in construction, as to require either demolition or very extensive alterations. These buildings are sunk beneath the level of the adjacent ground, and, being shut in and enclosed by walls, more particularly the latter, are deprived of a free circulation of air. The officers' rooms are low, small, and dark; and, although the ventilation has been attended to, it is found necessary to keep the windows and doors open night and day, to permit the air to enter freely and the officers to breathe.

The barracks are good, but too limited; the forts are consequently used to increase the accommodation. These works are placed on high ground, and might be healthy, but being sunken, and the barrack-rooms thereby built low in the ditches, a contrary effect results.

James Rose, Lieutenant Colonel,
Commanding 2d Battalion 2d Regiment.

Answers of Lieutenant Colonel *Robinson*, Commanding Royal Artillery.

1. I was not in Bermuda during the epidemic, and therefore cannot say what was the state of the air at that time; but, from what I find now existing, I should judge that the latrines and cess-pits must have had a deleterious effect on the atmosphere surrounding Fort Victoria, the head-quarters of the Royal Artillery.

2. Fort Victoria	600 feet.
Fort Catherine	1,474 „
Fort Cunningham	517 „
Fort George	708 „

3. At Fort Victoria there are two rows of casemates, with a long corridor throughout the entire length. No doors, except at the ends of this passage. The windows look into the

ditch. The foul air from the lower tier passes through iron gratings into the upper floor, instead of being properly carried away. The state of the air, particularly in the lower rooms, is muggy, and at night very bad.

4. At Fort Victoria there was and is no drainage; the latrines and urinals flow into a cess-pit, and are so offensive that they cannot be used in hot weather. No change has taken place in these arrangements since the epidemic, and it is therefore concluded that they were in a bad state at the outbreak of the fever.

5. The supply was plentiful. It was obtained from tanks. The quality was good, and the average quantity consumed daily per man about four gallons. No evil influence on the health of the troops could be attributed to defective or bad water supply.

6. At St. George's, intemperance prevailed to a very considerable extent; 38 cases of drunkenness were recorded between the 1st January and 30th June preceding the epidemic, in a detachment averaging 110 men; four were admitted into hospital directly, and five indirectly, from the consequences of intoxication.

7. I am given to understand that the extra duties imposed on the men at this time, such as burial parties, hospital orderlies, bakers, &c., caused numerous attacks.

8. At St. George's accommodation is provided for about half a dozen men of the Royal Artillery, giving upwards of 1,500 cubic feet per man. At the time of greatest crowding the cubic space per man was reduced to 363 feet.

9. Under ordinary circumstances the ventilation is good; but the drainage is defective, and the supply of water insufficient.

10. Wholly. The Royal Artillery at St. George's were placed under canvas on the 18th July, and the camp was moved on the 17th August.

11. (*a*) The glacis of Fort Victoria, 2d Artillery, that of Fort Cunningham.
(*b*) At Fort Victoria, 82; at Fort Cunningham, 67.
(*c*) Double bell tents, with single curtain.
(*d*) Three men per tent; cubic space per man, 167.

12. I believe fewer indigenous cases occurred amongst the men when under canvas at Fort Cunningham.

13. On the 23d September 1864. The numbers were—two officers, one sergeant, 69 rank and file. As only sound men were shipped away, I cannot see how this question applies.

14. The ventilation was not, and has not yet been improved. I cannot learn that any extraordinary measures were adopted as regards cleansing. Lime-washing is at all times frequently resorted to, and well-kept barracks are usually sweet and clean. Disinfecting fluids were freely used, and the cess-pits emptied just prior to the outbreak; but the latter are always offensive, and an ash-pit near the entrance to Fort Victoria is, in my opinion, a nuisance.

15. The sick of the Royal Artillery were not camped out. A camp for convalescents was established at Fort Victoria on the 18th August, which was afterwards removed to ground adjoining the hospital. A few patients were treated under canvas at Fort Cunningham, but with no better result than in the hospital.

16. I can form no opinion on this point.

17. The greater part arrived on the 26th January 1862. A draft of 32 men came out on the 25th October 1863.

18. I am unable to furnish any meteorological data or observations.

19. I consider that the casemates of Fort Victoria, the head-quarters of the Royal Artillery, should not be occupied except in time of war; or, if it be absolutely necessary to put men into the upper tier, the lower tier, which are many feet below the surface of the ground, should be given up. The rooms are exceedingly damp, ill ventilated, and so depressing, from their gloomy situation, as to drive the men out to drink. The foul air from below is dispersed over the upper flat by means of iron gratings, instead of being carried away by air shafts. The latrines and urinals should be improved and properly drained; and cheerful recreation and reading rooms, as well as a comfortable canteen provided. Increased washing accommodation and baths I consider necessary.

The following is the opinion of a Board of seven officers, of whom four were medical officers, assembled in April 1854, to report upon the state of the barracks in Bermuda. A copy of the proceedings of this Board is in my office: "The detached forts, consisting of West Redoubt, Forts Victoria, Albert, Catherine, and George, in the opinion of the Board, come under one category, the want of due cubic space, the average for each man being only about 370 cubic feet. Forts Victoria and Catherine are extremely damp, and the ventilation of the former very defective: the construction of the rooms faulty for habitable purposes, the officers' quarters small and gloomy, and the whole, especially during the summer months, very unfit for the accommodation of men, and should not be occupied by such numbers, except under military emergencies. The privies are at times most offensive owing to their position and construction, the soil being received in cess-pits."

I would suggest hut barracks, containing lofty and well-ventilated rooms, constructed like the American ice-houses, *i. e.*, with double walls, the space between filled with saw-dust, as a non-conductor of heat, until good barracks could be built for the troops.

I would further beg to recommend that, on any future recurrence of yellow fever, the men should be at once moved out under canvas; that a sanitary cordon be formed round each camp; that all commissariat duties, such as baking, carrying rations, &c., be performed by natives, and the rations, &c., delivered at certain points outside the camps, there to be received by fatigue parties. No soldier should be allowed to go into the infected towns, and public property should be guarded by paid native watchmen, or, still better, by black troops from the West Indies.

As it is understood that the officer commanding Royal Artillery at Ireland Island has received copies of these questions, I have thought it unnecessary to make any observations connected with the troops there; my replies have reference only to St. George's, the head-quarters of the Royal Artillery.

J. Robinson, Lieutenant Colonel,
Commanding Royal Artillery.

St. George's, 12 June 1865.

Answers of Mr. Barrow, Deputy Inspector General of Hospitals.

1. The health of all the troops either quartered in barracks or living under canvas in the vicinity of the town of St. George's suffered, in my opinion, from the unwholesome condition of the atmosphere, engendered by the wretchedly defective sanitary state of the town.

St. George's lies in a hollow, surrounded by high land on the north, east, and west, the harbour forming the southern boundary; but even from this quarter the sea breeze is to a great extent shut out by high buildings on Ordnance Island. This island is of small size, and separated from the town by a very narrow channel, where refuse matter and filth of all kinds may be seen floating about. The streets of St. George's are merely narrow filthy lanes; the houses (built of the porous conglomerate stone) are generally of small size, and the flooring is scarcely ever raised above the level of the ground; the ceilings are low, and the state of ventilation almost invariably most defective. There is almost a total absence of sewers; abominable cess-pits abound in all directions.

Unventilated rain water tanks are placed underground in close proximity to the houses, and privies; in some instances they are situated directly under the flooring of dwelling rooms, giving rise to damp unwholesome exhalations. Refuse animal and vegetable matter was often allowed to accumulate and become offensive during the process of decomposition. Butchers' shambles were situated near the centre of the town for more than a month after the outbreak of fever. The wharves were lumbered with coal and cotton, and as a general rule were in a filthy condition; in addition, many of the houses were overcrowded to excess by sailors and others engaged in blockade running, the population of the town being thus increased by at least one-third. In the suburbs a free circulation of air is greatly impeded by high walls, thick hedges of Oleander bush, or Cedar trees. With so many defective hygienic conditions it is not surprising that yellow fever, one of the most destructive zymotic diseases, showed such malignancy in this locality, and in epidemic seasons the troops quartered in the neighbourhood can scarcely avoid suffering from the extreme neglect of proper sanitary measures on the part of the civil authorities.

2. I was not in Bermuda at the commencement of the epidemic.

3, 4, 5 and 6. Same answers.

7. They were increased by military duties in two instances. Soon after the commencement of the epidemic outbreak, parades, drills and nearly all guards were discontinued, and the troops were encamped with promptitude. The head quarter wing of the 2/2d Regiment evacuated St. George's, and was encamped on the peninsula at Ferry Point, three miles south-west of the town; but it was not foreseen, unfortunately, that the hospital establishment should have been moved at the same time, and also the commissariat chest and supplies. The consequence was that a continuous drain had to be made upon the force at Ferry Point; soldiers were sent to St. George's for multifarious fatigue duties, such as drawing rations, attending the sick, burying the dead; they were also required to pitch hospital marquees, act as boatmen, officers' servants and orderlies in the very locality where the epidemic influence was most intense. In most instances they resisted this influence for not more than five or six days, and were then struck down by the disease, to be replaced immediately by other men from the healthy camp; this impressed me forcibly on the day of my arrival in Bermuda;* I at once represented to the officer commanding the troops, the necessity of preventing soldiers entering St. George's, which could only be done at that late period by employing black labour. There was some difficulty in following out my recommendation, as so many blacks were engaged in coaling blockade-running ships, at very high wages; but by degrees black labour was obtained; there were then no more requisitions on the 2/2d Regiment at Ferry Point for duties of fatigue, and consequently the admissions into hospital ceased at St. George's after the 13th September as far as the 2/2d Regiment

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* The 26th August 1864.

2/2d Regiment was concerned, with the exception of one or two cases of relapse. A few coloured nurses had been employed in the general hospital as early as the beginning of August; their number was gradually increased until about the 7th September, when nearly 50 were employed in the hospital building and marquees, and others were attending sick officers, their wives and families. This measure was without doubt the means of saving the lives of many soldiers. To show the amount of sickness and mortality produced by fatigue duties, I traced the history of 143 men of the 2/2d Regiment either left in St. George's when the head quarters marched to Ferry Point, or sent in from the camp; 103 of these men were seized with fever, and 55 died, being at the rate of 384·61 per 1,000. The 40 men unattacked were fortunately relieved in time, and owed their escape only to the limited period of their exposure to the miasmatic influences.

A second instance occurred at Ireland Island, where military duties undoubtedly caused many attacks of fever. I found on my arrival, that with the exception of camp sentries, all guards had been abolished which were under the control of the military authorities. One guard, composed of 26 men, was, however, still considered necessary at Ireland Island for the protection of the naval hospital, spar yard, and dockyard, which latter contained stores of immense value. This guard was under the orders of the senior naval officer on the station, he being responsible for the safety of the public property. I lost no time in protesting against the continuance of the guard, for it was either necessary to march the men daily from the camp at Boaz, a distance of nearly two miles, to Ireland Island, where the men occupied a hot, badly-placed guardroom in an unhealthy locality, or else to form a camp in the immediate neighbourhood of the dockyard, from which the guard could be furnished. The records in the medical office showed very plainly the loss of life resulting from the continuance of this guard during the epidemic of 1853. The officer commanding the troops acted upon my advice, and strongly urged, upon more than one occasion, the necessity of withdrawing the guard. After some delay the sentries were gradually reduced, and the guard was finally abolished on the 1st October.

On the 30th August nearly 100 men were moved from Boaz, and encamped on and near the glacis at Ireland Island. Not much was gained by this step, for although it saved the troops a march of two miles to the dockyard the locality was not so advantageous for the formation of a camp as Boaz Island.

A tent was pitched outside the hot guardroom in the dockyard for the use of the men on guard.

8. At St. George's the sick of the Royal Artillery and Royal Engineers were, at the commencement of the epidemic, treated in a hired building at the base of the hill on which Fort George is situated, in the western suburb of the town. The cubic space of the wards was a little over 10,000 feet, the accommodation, therefore, at 1,500 cubic feet per man, would be for seven men. By the returns I find there were 26 men in hospital on the 24th June. They were not all, however, in the building, eight men being treated in a marquee. Each of the remaining 18 had, therefore, only about 560 cubic feet of space. This hospital was given up on the 2d August, the site being very unhealthy, and the sick (then only seven in number) were treated in a marquee near the military hospital. This is now the only military hospital in Bermuda. It is situated near the sea on the north-east shore of St. George's Island, about one-third of a mile from the town. The wards contain 36,000 cubic feet of space, and the building was intended for 48 patients at 750 cubic feet per man; but as in this climate at least 1,500 feet should be the allowance, it would barely accommodate 24 sick. The greatest number in hospital on one day was 103, and it occurred on the 2d September. Of this number, 24 were treated in four marquees, eight or nine were placed under the hospital verandah, and 70 were in the wards; each man had, therefore, only 514 cubic feet within the building. This very over-crowded state continued for only a few days after the 2d September. I requested the commanding officer to collect an additional supply of marquees, and pitch them near the General Hospital. By the end of the first week in September, eight marquees had been erected, and all men fit to be moved were placed under canvas; this measure eased the hospital building greatly. On the 17th September there were only 25 men in the wards, and shortly afterwards the ground floor was not even required.

At the camp, Ferry Point, there was ample hospital marquee accommodation, admitting of only seven or eight sick being treated in each marquee. Each man had at least 420 cubic feet, if the total cubic space in a marquee is estimated at 3,366 feet. The ground was generally planked, and each man had an iron bedstead, horse-hair mattress, and pillow.

At Ireland Island the sick were treated by the navy medical officers in the Royal Naval Hospital, where there is excellent accommodation for 80 patients.

9. The wards in the General Hospital are well ventilated; they have air inlets and ventilating shafts, and the windows are of a good height. In this climate it is necessary to keep the windows open during the greater part of the year. The drainage is tolerably good; a new system is about to be introduced generally. All drains will then be flushed several times daily by means of sea water, to be raised by steam power. This scheme will entirely do away with cess-pits in the neighbourhood of the barracks. The hospital is supplied with rain water, which is collected from the roof and stored in tanks. The supply is not sufficient when the demand is great, or in dry seasons, because the tank water is used in the water-closets; over these closets there are reservoirs, which are filled daily by means of a force-pump. Sea water could easily be made use of for this purpose, and might be raised by a windmill, as at the Naval Hospital; but larger reservoirs would have to be provided.

10. The head-quarter wing of the 39th Regiment marched out of the Royal Barracks, St. George's, and was encamped at Ferry Point on the 23d July. The 2/2d Regiment arrived in Bermuda on the 15th July, and disembarked on the 16th; the head-quarter wing landed, and was encamped at the Navy Tanks, and the left wing at Boaz Island.

The right wing was removed to the camp at Ferry Point on the 1st August, the 39th Regiment having sailed for England on the 27th July. This wing remained at the Ferry until the epidemic ceased, not returning to the Royal Barracks, St. George's, until the 24th January 1865. The left wing remained at Boaz until it embarked for Halifax on the 10th and 24th September. On the 18th July the Royal Artillery marched out of Fort Victoria, and was encamped on the glacis.

On the same day two-thirds of the Royal Engineers were encamped outside their barracks, followed shortly afterwards by the remainder of the men. Both the Royal Artillery and Engineers were removed on the 15th, 16th, and 17th August to the glacis at Fort Cunningham, which is rather more than a mile south-east of St. George's. The Royal Artillery at Ireland Island moved out of the Casemate Barracks on the 25th August, and encamped on the glacis. On the 14th September they shifted their camp, but were still on the glacis.

11. The respective positions of the camps, and the approximate numbers in each locality, are given in the table annexed. Bell tents, of double canvas, were issued to the troops at all the camps; they have a few small ventilating apertures in the canvas, near the top of the pole, and two or three still lower down; three men lived in each tent. If we estimate the cubic space of a bell tent at 513 feet, each man would have 171 cubic feet. Every man had an iron bedstead, and a horse-hair mattress and pillow.

ENCAMPMENTS.	2/2d Regiment.		39th Regiment.		Royal Artillery.		Royal Engineers.	
	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.
The Peninsula, Ferry Point - -	10	276	–	–	–	–	–	–
Ditto - - - ditto - -	–	–	17	483	–	–	–	–
Boaz Island - - - - - -	9	379	–	–	–	–	–	–
Glacis, Ireland Island, 30th August -	1	100	–	–	–	–	–	–
Glacis of Fort Victoria - - -	–	–	–	–	–	82	–	–
Ditto - Fort Cunningham, 16th Aug.	–	–	–	–	3	67	2	76
Ditto - Ireland Island - - -	–	–	–	–	1	80	–	15
Camp near Royal Engineer Barracks	–	–	–	–	–	–	–	119
Ditto - Walsingham - - -	–	–	–	–	–	–	–	9

12. The effect of encamping the troops was, without any doubt, most beneficial, when its full influence was in action. But, as I have stated, in answer to Question No. 7, the good effect was most materially diminished at Ferry Point by the system of sending in large fatigue parties to St. George's, the very locality where the danger was greatest. Directly this was prevented, both the sickness and mortality ceased; not one combatant officer of the 2d Queen's contracted fever at this camp, and only one of the bandsmen. This is accounted for by the fact that the officers and the bandsmen kept closely to the camp. Three medical officers who had recently arrived in Bermuda were doing duty at Ferry Point; two never left the camp, and escaped fever; the third (Assistant Surgeon Lodge, 2d Queen's) frequently visited St. George's; he was soon attacked, and died. After the epidemic the convalescents at this camp were paraded at my request, and questioned.

It appeared that out of 61 men attacked, all except seven had marched to St. George's on duty a short time before being seized with fever. Several even of the seven had, in all probability, contracted the fever at St. George's previous to the formation of the camp. It was also discovered that the whole of the 17 men who died had been employed at St. George's a short time before being attacked.

At Boaz Island the good effect of encamping the troops was never properly experienced, as there also the same system was in force of sending away men from a healthy camp to mount guard in a dangerous locality, such as the dockyard at Ireland Island.

There was abundant proof of the danger of this measure, too plainly demonstrated by the sad records of the epidemic of 1853. Directly an opportunity offered, on the arrival of Her Majesty's ship "Galatea," I urged the necessity of at once sending away these men to Halifax, in preference to any stationed elsewhere, and this was carried out as far as possible. Nineteen officers were living at Boaz, eight of whom contracted fever, of a mild type in nearly every instance, and no death occurred: 99 men, out of 379, of the 2d Queen's, contracted fever at Ireland or Boaz, and 33 died. I am unable to determine how many died through mounting guard in the dockyard, but the proportion is large. Had the guard not been required, there was no necessity to keep troops during the epidemic at either Ireland or Boaz, and had the latter island proved unhealthy, Prospect Hill could have been occupied as a camp ground; but, judging by the nature of the fever type among the officers, women, and children, I think but few grave cases originated at Boaz. There are, certainly, too many buildings on the island, and the drainage is somewhat defective.

The men of the Royal Artillery were moved out of the Casemate Barracks at Ireland, and encamped on the glacis, as they also furnished a certain proportion of men for the dockyard guard.

When the "Galatea" returned after taking the first detachment of the 2d "Queen's" to Halifax, I recommended all the remaining healthy artillerymen and engineers to be sent to Halifax, both from Ireland and Fort Cunningham, together with the unattached men of the 2d "Queen's" at Boaz and Ireland.

This was carried out on the 24th September, although not entirely according to my suggestion, for a detachment of the 2d "Queen's" of about 50 healthy men was still left behind in order to furnish the dockyard guard. At this period some convalescents from the earlier cases had recovered sufficiently to be placed on guard, and were so employed, but they could not be obtained in any great number. The men of the Royal Artillery and Engineers, after being placed under canvas at Fort Cunningham, never experienced the full benefit of the change from the camp near Fort Victoria. The results of the first 20 days were not encouraging, the men had unfortunately been kept too long under canvas near Fort Victoria, and consequently in the vicinity of the town of St. George's. Their systems had become saturated with the blood-poisoning influences pervading the atmosphere, and numerous severe cases of fever appeared. Some of the men had also to proceed to St. George's occasionally, in order to draw rations, and this kept up the disease. It was necessary to employ them on this duty, on account of the extreme difficulty in procuring sufficient black labour. The cause of the delay in moving the artillery and engineers from the glacis of Fort Victoria was owing to the want of medical officers, three of whom were prostrated with fever at St. George's during the first half of August. When the "Galatea" returned from Halifax on the 24th September, the remaining healthy men were, as I before stated, sent away to Halifax. On the whole I consider the camp ground to be a healthy one; it is about one mile and a quarter distant from St. George's town; the land is well elevated and exposed to the wind from every quarter.

13. On the 9th September eight officers, and 201 non-commissioned officers, rank and file, of the 2/2d regiment, sailed for Halifax in H. M. steam frigate "Galatea."

On the 24th September a second detachment, composed of two officers and 70 men of the Royal Artillery, one officer and 67 men of the Royal Engineers, and one officer and 51 men of the 2/2d regiment, also sailed for Halifax in the same ship. This was done at my recommendation, as I consider it the most effectual way of saving the men's lives. Four cases of fever appeared among the troops, either during the voyage, or at Halifax, three of which terminated fatally. The disease then altogether ceased, and I have no hesitation in declaring my opinion to be that the measure of removing the troops to Halifax was the means of saving many lives. Had it not been done the epidemic would probably have been as destructive as that of 1853.

14. I was not in Bermuda at the time.

15. On the 2d August the sick of the Royal Artillery and Engineers were moved out of the hired hospital building in the town of St. George's, and were placed in marquees near the General Hospital.

Seven patients were treated there, three of whom soon contracted fever, and were removed to the hospital building. Two out of the three died. On the 18th August a few convalescents of the Royal Artillery, Royal Engineers, and the 2/2d regiment, were encamped on the glacis of Fort Victoria. On the 26th August, and the following seven days, additional marquees were set up near the hospital. By the 27th August there were 20 convalescents of the Royal Artillery and Engineers under canvas, and nearly the same number of the 2/2d regiment. No acute cases of fever were treated at St. George's in tents, but directly men were sufficiently recovered they were placed under canvas, and in this way greatly relieved the overcrowded hospital. The medical officers did not treat acute cases in tents, as an inconvenience would be experienced in procuring hot water for fomentations, and there was a possibility of improper articles of food and drink being introduced. The latter did occur in several instances. There was a marked difference in the death rate among the sick at St. George's and at Ferry Point, as the following table clearly indicates:—

LOCALITY.	Number of Cases.	Number of Deaths.	Ratio of Deaths per 1,000 Sick.
Fever Cases treated in the Hospital Building, St. George's.	291	107	367·69
Fever Cases treated in Marquees, Ferry Point	61	17	278·68

Thus the ratio of mortality among the sick at St. George's exceeded that at the camp, Ferry Point by 89·01 per thousand, and this was owing to the purer atmosphere of the camp, as would be expected from the natural advantages of the position, and the unpolluted state of the ground. It must be remembered that nearly all these cases originated at St. George's. A few days after my arrival in Bermuda I was very anxious to get the entire hospital establishment removed from St. George's. An effort was accordingly made to send all the sick to Port's Island, where there is an old Quarantine Hospital. The plan, however, could not be carried out; there was a very great difficulty in procuring labour and transport; the sick, also, began to increase rapidly in numbers, many of the cases being of so grave a character as not to bear removal; and lastly, all the medical officers lately arrived at St. George's, from Canada or Halifax, were struck down with fever. Six were attacked between the 29th and 31st August, four of whom died. A few sick men were treated under canvas, both at Fort Cunningham and Boaz Island, but their number was too small to be of value statistically. If I were asked whether it would be better to treat yellow fever patients under canvas or in the airy wards of a well-constructed hospital, in a locality with no sanitary objections, I should, without hesitation, declare my opinion to be, that the hospital offered the greatest advantages.

16. I cannot pronounce in favour of any particular course of treatment. Specific yellow fever belongs to the zymotic class of diseases, and is produced by the action of a specific poison on the blood; it assumes different types, and the treatment must necessarily vary accordingly.

An attempt was made in several instances to "abort" the attack, as it is called, by Dr. Blair's treatment of administering large doses of quinine and calomel; a scruple of each repeated after an interval of a few hours. This treatment was not found successful. Quinine in large doses checks the secretions, and tends to produce congestion both of the brain and abdominal viscera. Large doses of calomel are apt to create an irritable state of the bowels, followed by a frequent and exhausting discharge of thin, watery stools, which by degrees assume the appearance of black vomit. All "heroic" treatment is dangerous in this disease. A modification of Blair's treatment was tried in some cases. After the action of a warm water emetic, eight or ten grains of calomel and the same quantity of quinine were given in the form of soft pills; this seemed to answer in my own case, but failed in many others. I believe we have no more power to cure yellow fever than we have to cure typhus, or typhoid fever. They all run a specific course, and any very active treatment is injurious or positively dangerous. We know exactly what symptoms to expect, and what organs or structures are likely to become affected. The safest course to pursue is to carefully watch the progress of the disease, and treat symptoms as they make their appearance. The mucous coat of the stomach and bowels becomes more or less congested or inflamed from the third to the fifth day; the kidneys are similarly affected about the same time, their secreting structure is then very liable to become clogged up with epithelium and tube casts, causing suppression of urine. Urea, the principal constituent of this secretion, instead of being eliminated, remains in the blood, and is circulated through the brain, on which it acts as a poison, producing coma and death. Our efforts should, therefore, be directed towards the elimination of urea from the blood, and this is principally accomplished by keeping up a free action of the skin. Diaphoresis was easily established by means of pediluvia. The warm bath was generally found to be too exhausting; sinapisms over the kidneys, dry cupping, or the abstraction of blood by cupping, relieved the congested state of the kidneys; the same applications also relieved the congestion of the stomach, and checked vomiting. Black vomit was most frequently seen on the fifth day, when death resulted from syncope. Stevens' saline treatment was tried in some cases, but with no good result. Chlorate of potass was tried by itself, on account of the large proportion of oxygen it contains. Turpentine was also administered, morphia, &c., without a salutary effect. During the hot stage only the blandest drinks should be given, or small pieces of ice may be sucked. When the circulation begins to flag, iced milk in teaspoonfuls, with the addition of a few drops of brandy, is perhaps the best form in which to administer support. No solid food of any kind must be taken into the stomach, the danger would be excessive; in all probability it would be quickly followed by a discharge of black vomit. Even during the early period of convalescence there is great danger in eating solid food; relapses are brought on, in most cases, by this imprudence, and frequently prove fatal. The hæmorrhagic type of the disease prevailed to an unusual extent in St. George's. Nearly all the fatal cases were accompanied with black vomit, and Dr. Parke Tucker informs me he remarked the same fact in his practice. The fifth day was the most fatal, and from 25 to 30 was the most dangerous age; convalescence was protracted, without any exception.

17. No. 34 company Royal Engineers arrived 6 December 1861.
No. 5 company Royal Engineers arrived 16th January 1862.
Nos. 2 and 3 batteries Royal Artillery arrived 23d January 1862.
A draft of 31 men, Royal Artillery, arrived 25th October 1863.
The 2/2d Regiment arrived 16th July 1864.

18. For some time previous to my arrival the Observatory had been out of working order. The barometer was broken, and the thermometers were unreliable. I am able to state that the disease was materially affected by atmospheric changes. Violent southerly gales set in on the 1st September, accompanied by torrents of rain; this had a marked effect over the progress of the disease. The admissions at St. George's and the camp at Cunningham,

which had the day previously amounted to 17, dropped to eight, and next day to five; on the 3d, there were eight; on the 4th, three. The mortality, however, was not influenced. The effect was very marked also at the camp Ferry Point, but not to the same degree at Boaz and Ireland. This is at once seen on reference to the table of daily admissions from fever at all stations. Violent thunderstorms also occurred during the night of the 7th September and the whole of the 8th, the force of the south-west wind reaching 10, very heavy rain fell at intervals. During the three following days there were only five admissions at St. George's, while at Ferry Point there were no admissions for a week afterwards, and only five at Boaz and Ireland during the same period. Mr. Lawson (Deputy Inspector General of Hospitals) calls yellow fever a "disease of fine weather." He observed that in November 1856, yellow fever almost disappeared for three weeks at Newcastle, Jamaica, during wet weather, but it commenced again as soon as the season became settled and fine. The fact of heavy rain stopping epidemics of yellow fever and of cholera has been often observed by army medical officers and others in different parts of the globe.

During the early part of November 1864, the temperature was lower than in ordinary seasons, and fever seemed to have disappeared altogether; but after the middle of the month southerly winds prevailed, and the air became sultry and oppressive. On the 20th November there was a sudden reappearance of fever at St. George's, Hamilton, Mount Langton, Ireland Island, and several other places simultaneously. Dr. Hilditch, R.N., remarked a similar circumstance during the epidemic of 1853. The cool weather of December quite destroyed the vitality of the disease. The last case amongst the troops appeared on the 12th of that month, but in the town a few cases were seen up to the 5th January 1865.

19. Before I submit any sanitary suggestions, I must briefly touch upon the question of the origin of this epidemic outbreak.

The earliest cases observed by any one occurred in a coloured family, named Tucker, living at a place called "Devil's Hole," south of Harrington Sound, in Smith's Parish, about six miles south-west of the town of St. George's. The father and two sons came daily to the town of St. George's, and were employed on the wharves in coaling ships. One of the sons, named Henry, was the first attacked. He was seized with fever on Sunday, the 19th June, and next day was visited by Dr. Outerbridge, a civil practitioner, residing at Bailey's Bay. The father, John Tucker, was next attacked on the 21st June, two days after his son Henry, and was seriously ill for a fortnight. These men were employed in coaling vessels at West's wharf. Neither had been on board the steamer "Fannie," which ship was said to have brought cases of yellow fever from Nassau, where the disease had just appeared, nor had they had any communication with either the crew or passengers. Henry, the first attacked, had been a week previously on board the "Index" steamer, from Wilmington, a healthy port. Lastly, the other son, Christopher, contracted fever a few days after his father; he cannot remember the exact date, but it would probably be about the 24th June. This man had been employed coaling the steamer "Fannie," which left Nassau on the 9th June, reaching Bermuda on the 13th. He believed he contracted fever while on board. The attack was so slight that he was not confined to his bed.

Dr. Outerbridge declares that the three men suffered decidedly from yellow fever.

In December 1864, I examined these men in presence of Dr. Burland, R.A., the health officer of the port, who fully confirms what I now state. If the two men first attacked did really suffer from specific yellow fever, the evidence would be sufficient to establish the fact that the disease originated in Bermuda, either at Devil's Hole, or at St. George's. No other ship besides the "Fannie" had arrived from Nassau (the only infected port) during the first 19 days of June.

As regards the "Fannie," it has since been proved that no case of yellow fever had appeared on board, either during the voyage from Nassau, her stay at St. George's, or on the voyage to England. The history of the first undoubted and also fatal case of yellow fever, is as follows: A man named Alton (a European), engaged in "running the blockade," left Nassau on the 9th June 1864, in the steamship "Fannie," at which period there had been several cases of fever in the island. During the four days' voyage to Bermuda Alton suffered from tertian ague. The "Fannie" anchored in St. George's harbour on the 13th June. On the 18th, Alton applied to Dr. Hunter of St. George's for medical advice; this gentleman found him to be suffering from intermittent fever, and recognised the type as tertian.

During the intervals of the paroxysms, Alton felt quite well, and walked about the town and country. He slept at a Mrs. Walsh's, on high land, to the rear of the gaol, and had three attacks of intermittent fever while living there, which were observed by Mrs. Walsh. On the 23d June he was again seen by Dr. Hunter; continued fever set in on the 25th, and he died jaundiced and with black vomit on the 30th June. The medical question then arises, could this man while suffering from intermittent fever, have contracted yellow fever at Nassau, and the latter disease remain in a state of incubation for 16 days, when the intermittent type suddenly changed, and decided yellow fever made its appearance? It is contrary to all medical experience that two distinct fevers can remain in the system at one time; one lying dormant, or in a state of incubation, and the other being in activity. But we do not unfrequently see in Jamaica an intermittent suddenly change its type, when the epidemic wave passes over a district; the disease may then quickly assume the essential yellow fever characteristics on being subjected to a new specific influence. There is no doubt but that Alton did suffer from tertian ague, both Dr. Hunter and Mrs. Walsh, his landlady, give satisfactory evidence on that point. Mrs. Walsh states that Alton knew to an hour when to expect a seizure, and was perfectly well between the attacks. The house was situated in a hollow, with many shrubs and dense bush in the immediate neighbourhood obstructing a free circulation of air, and the general sanitary state around the house was decidedly bad. The next case appeared not very far off, but at a lower level to the south-west of the gaol, in a small house cut off from all winds, by high land and trees. Three privies were close to the lower side of the house; a horse and pigs were kept in rear, and the sanitary state was altogether exceedingly defective. George Williams was a passenger in the steam-ship "City of Petersburg," which vessel left Nassau on the 27th May, bound for Wilmington, and arrived at Bermuda on the 10th June. Williams was attacked on the 10th July, 45 days after leaving Nassau, and 34 after leaving Wilmington, a healthy port, consequently he must have contracted the fever in Bermuda. No communication with Alton can be traced.

Other cases soon followed in this outskirt of St. George's. The disease then became pretty general; by the 16th July it had reached the eastern portion of the town. On this day, the first soldier (a sergeant of the 39th Regiment) was attacked. Fever soon extended to the men of the 2/2d Regiment, who were encamped at the Navy tanks; the first case occurred on the 23d July, and next day two others appeared. Curiously enough, the first case at Boaz appeared in the left wing of the regiment on the very same day as the first case in the head-quarter division at St. George's. Corporal James Moffatt, 2/2d Regiment, had been on guard in the dockyard, Ireland Island, on the 22d July; he slept in the unwholesome guard-room, and next day was seized with fever. He had never been in St. George's. On the 24th and 26th July, Privates Bartlett and White were attacked; they had not been at any time in St. George's, nor been in communication with anyone from that town. A few cases continued to appear until the 15th August, when the disease became general at the camp. The men of this regiment were highly susceptible of yellow fever, having just arrived from Gibraltar.

On reference to the daily return of admissions it will be seen that the more acclimatised men of the Royal Artillery and Engineers were not attacked until much later, both at St. George's and Ireland. The dockyard people at Ireland did not begin to suffer until the 15th August, on which day the first case appeared, followed by two others on the 17th. The first person attacked was a child, on board the "Tenedos" hulk, named Matthew Tynes, aged seven, son of a soldier of the 39th Regiment. The child and his mother had left St. George's on the 14th August; he was seized with fever the next day, and died on the 17th. The next two attacked were dockyard labourers (Europeans) living in Victoria-row and Portland-square. They had never been near St. George's; both were seized on the 17th August and recovered. The disease became intense by the end of August, and continued so all September. The first case at Hamilton appeared on the 29th July; the patient was said to have been lately at St. George's. The disease gradually increased in severity, and arrived at its height about the 13th September.

In St. George's the greatest intensity was reached about a fortnight earlier. The fever thus first appeared on the 19th June at St. George's. After 34 days it travelled to Boaz Island; reached the city of Hamilton in 40 days; the parishes of Smith's, Sandy's, and Warwick, in from 45 to 48 days; Ireland Island (in Sandy's) in 57 days; and Paget's in 65 days. There was far more general communication with the town of St. George's than usual during the entire epidemic, as so many people were attracted there by the high rate of wages, and yet the epidemic travelled slowly among the islands in spite of the free intercourse. Between St. George's and Hamilton there was constant free communication, but 40 days elapsed before the fever appeared in the latter city. It must, however, be acknowledged that 14 days after fever had fairly set in at St. George's (which was about the 23d July) it soon became pretty general, few places not having been attacked by the 6th August. It reached the town of Hamilton six days after the 23d July. I saw nothing to convince me that the disease was spread by means of contagion.

As usual, the inhabitants believe, generally, that the fever was introduced from without, and did not originate in these islands; they therefore have a strong disposition to put their entire trust in a strict system of quarantine, rather than direct their attention to the wretchedly defective, or, I may say with truth, the utterly neglected sanitary condition of the islands. There was every essential condition in Bermuda necessary for the development of yellow fever, such as geographical position, the proper degrees of heat and humidity, and a susceptible population; the latter was greatly in excess of ordinary years at the time of the late visitation. There has never yet been any proof of the introduction of the disease into these islands, but several commissions have determined the contrary, that it spontaneously originated in the Bermudas. Quarantine has most signally failed to ward off the pestilence, and this will ever be the case. Let us inquire, on the other hand, what benefits may be expected to follow a proper application of the laws of sanitary science. First, look at Gibraltar; fearful epidemics of the same pestilence were by no means uncommon in the days of sanitary neglect. It was observed they always commenced in the filthiest and most crowded localities. The epidemic of 1828 brought this fact so prominently to notice, that much attention was directed to the subject, and very great improvements were carried out, especially as regards drainage. The results were highly satisfactory, and now epidemics of yellow fever are unknown. The Danish island of St. Thomas suffered some years back, perhaps, more severely than any other country in the world; scarcely a year passed without an epidemic visitation. The harbour of St. Thomas is almost completely land-locked. On the shores there were vast accumulations of coal; all the filth and sewage matter from the town found its way into the harbour, drifting about with the tide, and giving off most offensive exhalations. It was not to be wondered at that the crews of the overcrowded steamships exposed to such influences in a high temperature suffered greatly from year to year visitations. The foul state of the harbour was the cause of an experiment being made, the result of which was very satisfactory. It was determined to cut a canal through the narrowest portion of the land encircling the harbour, as near the town as possible, and thus to open a communication with the sea outside. As the tide then entered the harbour, a current would be established, and the foul water be effectually cleared out. The plan succeeded, but not exactly in the manner expected; for the current set in through the canal, still more effectually clearing out the body of water.

Since this canal has been cut (which was about three years ago) there has not been any severe epidemic outbreak.

New Orleans suffered annually from more or less severe epidemic attacks, until the United States' army occupied it three years ago. Great sanitary improvements were then energetically carried out, and there has been no epidemic visitation since. Professor Parkes, in his work on "Practical Hygiene," declares that the accumulation of "excreta" around dwellings, and overcrowding, are evident causes of the localisation of the disease. He adds, "It is now coming out more and more clearly that, to use a convenient phrase, yellow fever, like cholera and typhoid fever, is" a fæcal disease.

The enforcement of proper sanitary measures is greatly needed in Bermuda. At present the vestries of the different parishes act, or are supposed to act, as Boards of Health. The action is, however, very "spasmodic," and seems to me to be on the principle of shutting the stable door when the horse is stolen.

I believe there is a "nominal central" Board, composed of the Governor and Council. The Central Board should be composed of men of position in different parts of the islands, selected on account of their ability and knowledge of sanitary science. They should be a paid and responsible body, composed largely of medical men; and I suggest that the senior medical officers of both the army and navy are at all times members. They should make regular visits of inspection throughout the islands, and co-operate with the local Boards of Health. An amended Public Health Act came into operation on the 25th August (more than a month after the outbreak commenced). It gives additional powers to boards of Health, and contains regulations respecting the removal of nuisances, burials, slaughter-houses, manufactories, infected vessels, cleansing of houses, lodging houses, &c., also appointing inspectors of nuisances. The first desideratum and matter of the greatest importance is the total abolition of cesspits in the towns of St. George and Hamilton, and the construction of sewers. Sea water can be obtained in any quantity for the purpose of flushing, and it can be raised into tanks by windmill or steam power at no great cost. There may be some little engineering difficulty at St. George's to find out the most suitable place for the escape of the sewage matter, so that it may be quickly carried out to sea; but this will not be unsurmountable. The next question of importance is the water supply, which is very deficient generally. Rain water is caught from the house tops and stored in underground tanks, but very many houses have no tank whatever. In some instances the rain water is caught in barrels, where frequently it quickly decomposes. An enactment should provide that every house has a water-tank of sufficient size, and properly cemented. It should never be placed under houses, nor in contiguity with privies, and it should be thoroughly cleaned out at least once a-year. The narrow streets of St. George's should be widened, and "gaps" left to admit the south wind. The streets, back premises of houses, and pieces of waste land should be kept thoroughly clean; ashpits and dust heaps frequently cleared out; dwelling houses should be efficiently ventilated and kept clean, and no over-crowding allowed. Cemeteries and butchers' shambles should be situated at a considerable distance from towns.

As regards the troops many sanitary improvements are required. The barrack accommodation is too limited, not only in St. George's, but throughout the command.

Allowing 600 cubic feet per man there is only barrack room for 757 men, while the average strength may be estimated at 1,150. In this climate every man should have at least 750 cubic feet of air; this would further reduce the accommodation, and 606 men only would be properly housed. But the two lower floors in each redoubt should not be occupied by troops in time of peace. They are excessively close and unwholesome, quite cut off from any circulation of air, being near the bottom of dry ditches from 30 to 35 feet in depth.

At present a system is in force of encamping one-third of the troops during the summer months. This certainly eases the barrack-rooms, but is a cause of great discomfort to the men encamped, and, I believe, injurious to their health to a slight extent, for the heat in a tent during the daytime is excessive. I am not prepared to state that the sick list shows an increase among those men living under canvas, but their systems become debilitated from the continuous heat; a tendency to visceral congestions is promoted which may, at some future period, result in actual disease.

I therefore think that the plan of encamping one-third of the troops in summer should only be adopted as a palliative measure until sufficient barrack accommodation is provided for the whole force. At the present moment about 200 men of the 2/2d Regiment are housed in the convicts' old prison houses at Boaz, which are fitted up as a temporary barracks, and answer tolerably well; but it is quite possible the convicts may again be sent to Bermuda, in which event the prison houses would be re-occupied by them. The cesspit system is still in force; but a scheme of sewerage is in contemplation which, I trust, will be quickly carried out at St. George's. It is intended to construct the sewers so that the contents of every privy will be carried off into a main sewer, the outlet of which will run into the sea to the north-east of St. George's Island. Steam power is to be used for raising salt water, by which means the whole extent of sewers can be flushed daily. Either Jenning's or Macfarlane's privies should be introduced for the use of the troops, and Captain Galton's urinals, if it be found possible to maintain a continuous stream of water through them. The privies inside the various redoubts should, in times of peace only, be made use of during the night time. The cesspits should be filled up and tubs placed under the seats. They could be emptied every morning, and when not in use might be kept filled with water. A separate privy is required for the women and children. At a suitable distance outside each redoubt latrines should be provided for both men and women; they should be placed over sewers, and flushed from tanks in the vicinity. Ashpits ought invariably to be placed outside redoubts.

Much improvement is necessary as regards the ventilation of barracks, &c. The state of ventilation of the Royal Barracks, St. George's, is very defective; the windows require heightening, and ridge ventilation should be carried out along the entire length of the roof. Better under-floor ventilation is also required. The military prison is so surrounded by trees, buildings, and walls, that there is but little circulation of air within the structure. An additional storey is being built on the east side, which will cause an aggravation of the evil.

The officers' quarters to the east of the Royal Barracks proved very unhealthy during the epidemic. Of eight officers occupying these quarters, not one escaped fever, and three died. Two officers' wives and two children were also living in the quarters, and of these only one (an infant at the breast) escaped an attack. They are not sufficiently raised above the level of the ground, the rooms are very small and close, and the ceilings very low. Each officer is allowed only one room.

The ceilings might be heightened; and every officer should be allowed a front and back room. If the top of the partition wall were pulled down there would be a good draft of air through both rooms. A door would be required in the partition wall. The windows want heightening; they should be carried up to the roof.

The ground to the west end, in front of these quarters, should be lowered about two feet. The boundary wall keeps out a good deal of air; it might with advantage be replaced by an iron or wooden railing. Additional officers' quarters would be required, including quarters for field officers.

The main-guard building in the town is very badly ventilated; additional windows are necessary, and ridge ventilation. The upper rooms in the Casemate Barracks, Fort George, and also in the western redoubt, can be improved as regards the state of ventilation; circular openings could be made through the walls at the ends of the rooms, close to the arched ceilings. The lower rooms should not be occupied, except in time of war. The same applies to the lower rooms in Fort Victoria. The basement of the military hospital is made use of as a purveyor's store; this is very objectionable in a semi-tropical climate. There is not sufficient hospital accommodation in St. George's; the present building is only calculated for 24 patients, at 1,500 cubic feet per man. Two wings might be added to the existing structure. There is a deficiency of water in the hospital; this arises from the rain water being used to flush the waterclosets. Sea water might easily be raised, by means of a windmill, as at the Naval Hospital, Ireland Island. The outbuildings to the rear of the hospital, are all on too small a scale, and there is a great want of storeroom. The space enclosed is much too limited; the wall keeps out air; it should be replaced by high wooden railings.

The Royal Barracks are too closely surrounded on three sides by outbuildings, many of which could be removed with advantage. Some of them, moreover, are much too small for the purposes intended. The buildings I would recommend to be removed are the canteen, regimental orderly-room, barrack-office, sergeant's messhouse, bakery, and a few cottages for married men, near the military prison. Close by the prison also are some highly objectionable stables, which should certainly be removed. The regimental recreation-room is most uncomfortable, and far too small. The disreputable looking wooden theatre should be pulled down, and blocks of large, airy, wooden buildings constructed on the site, extending northwards towards the sea; but they should be well raised from the ground on stone arches or pillars. Another block of outbuildings could be erected more to the east, and running parallel to the first I have proposed. They might commence below the lowest cottage to the east of the engineer's wood shed, and extend northwards in the direction of the hospital. The trees to the east would have to be cleared away, and the two upper cottages, near the officers' privy, should be pulled down. They are very small, below the level of the road, too close to the privies, and in so unsanitary a state that in both the epdiemics of 1853 and 1864 there was great sickness and mortality among the inmates, which was certainly not to be wondered at. It would be better that these two proposed blocks of buildings should run east and west; but there is no site available, without obstructing the sea air from the barracks or officers' quarters. The recreation-room in Fort Victoria is more like a dungeon than a place of amusement.

The canteen is in Fort Albert; it is very small, uncomfortable, and inconvenient.

A suitable wooden structure for both canteen and recreation-room might be built outside, in a situation midway between both fortifications. No baths are furnished for the troops; there should be one for every 100 men. Water to an unlimited extent can be supplied from the large well in rear of the barracks. This water is scarcely brackish.

Quarters for staff sergeants and married men are greatly needed at St. George's for all corps. Regimental cells should be built in some airy situation; the present cells ought not to be used; they have no free circulation of air, are too small, and placed at the bottom of

sloping

sloping ground, so that the rain water accumulates under the building. The same objection applies to the regimental strong-room, which is a kind of cellar under the guard-room. The guard-room itself is commodious, but requires ridge ventilation.

The graveyard is badly placed; it is too near Forts Victoria and Albert, and another site should be chosen. I suggest that land for this purpose be purchased between the hospital and Fort Cunningham.

The dockyard guard-room at Ireland Island is most objectionable; it is situated at the entrance gates, below the level of the road, with high walls to the rear, so that fresh air can scarcely find its way into the building. It should be pulled down and rebuilt on a higher level on the opposite side of the road. The married men's quarters attached to the casemates require better ventilation. An additional supply of tank water is required for the troops in several localities. The supply failed at Fort Cunningham and Ferry Point when the camps were there established; neither would there be enough at Prospect Hill in the event of a camp being formed. At the western redoubt the rain water is caught from the parapet, and, after passing through a filter in the ditch, is allowed to enter the same tank as the water from the roof of the redoubt. It is all but impossible to prevent men at night voiding their urine on the parapet. The filter may separate the organic matter, but allows the various salts to pass through, on which account it is advisable that the water should enter a separate tank, when it might be used for washing purposes. The water caught on the parapet of the other redoubt might be stored in the same way. Wherever rain water tanks are found to be constructed under dwelling houses, they should be removed; they are found to be a source of great danger in yellow fever countries, owing principally to the state of dampness which they engender. In every instance where such tanks existed under military quarters, I found there had been great sickness and mortality among the residents both in 1853 and 1864.

Diet of troops.

Some change is necessary in the dieting of the troops. Salt pork should not be issued twice a-week during the summer season. Mutton might be issued one day in the week. So much fish is caught in summer that, I believe, an arrangement could be made to provide one company every day with a fish dinner, or if the men had nets they could catch the fish for themselves. About one and a-half pounds would be sufficient per man. Vegetables are scarce, and, consequently, dear. Every encouragement should be given to the men to form vegetable gardens. Many acres of Government land are available for this purpose.

Fuel.

Sufficient fuel is not issued to the troops to enable them to effectually make use of the ovens. This should be attended to, as it is of great importance that their diet should be varied.

Games, &c.

There is a great want of rational amusement for the troops, so necessary in this climate, and it in some measure affords an excuse for the intemperance which is found to exist in the Bermudas to a considerable extent. There are libraries, but the books are, in many instances, not well selected. There should be several covered-in skittle grounds and American ball alleys, racket courts, and fives courts, and more comfortable recreation rooms. Cricket and quoit playing should be encouraged.

Reduction of white troops.

I strongly recommend that Bermuda is made a three years' station like the West Indies. It is also highly advisable that the strength of the white troops should be reduced as much as possible, and black troops substituted. In this case, bearing in mind the past history of St. George's, I suggest that the black troops are concentrated at the east end of the group of islands, and that proper barracks are built in a healthier locality for the European troops. A certain proportion of the Royal Artillery must, however, be quartered at St. George's on account of the fortifications. I would keep scarcely any of them in the redoubts in times of peace; it would be better to erect temporary wooden barracks in airy situations near the base of the hills on which the forts are placed. These could be cleared away in war time, when the redoubts must be necessarily occupied. The old engineers' wooden barracks might answer the purpose, but they are so old and worn out that it would be better to pull them down and reconstruct them in a more open locality, and on a more modern system. As defensive works, on a large scale, are contemplated in the vicinity of Hamilton, I recommend that the Royal Engineer barracks are constructed at Prospect Hill, as well as barracks for the head quarters of a line regiment. After an examination of the ground, I am able to pronounce it eligible in many respects. Prospect Hill lies about a mile to the north of the town of Hamilton, the distance being a decided advantage. The open sea is seen about half-a-mile to the north. The Devonshire marsh is situated to the east, and the Pembroke marsh to the west. The proximity of these two marshes constitutes the principal objection to the site. With a proper system of drainage, however, the area might be greatly reduced, and there is no doubt but that much of the marsh land could be brought into profitable cultivation. The medical practitioners in the neighbourhood declare that intermittents are unknown, and that other fevers are rarely found in this locality, certainly not in greater proportion than elsewhere. The water in the marshes is brackish, and sensibly affected by the tides. The highest ground at Prospect Hill is about 150 feet above the level of the sea. The soil is scanty; there is a little grass land, but the Bermuda rock is seen on all sides.

At the present moment there is far too much bush and too many trees about the hill, but these objections can be easily remedied. If barracks are built in this situation, they must be raised from the ground on pillars or on open arches; broad and lofty verandahs should surround each block of buildings; every man should have at least 50 superficial square feet of space, and from 750 to 800 cubic feet of air. The windows ought to be carried up to the ceilings, which is by no means usual in Bermuda. Exceedingly small windows appear

to

to be the rule in these islands. I am unable to give my opinion as to the requisite accommodation of these barracks. It will depend upon the strength of white troops the military authorities decide upon keeping in the Bermudas in future. If it be again intended to introduce convicts, a larger number of white troops would probably be required. Under any circumstances, I would recommend the concentration of the white troops at Prospect Hill and Boaz Island. In this case the military head quarters would, no doubt, be removed to Hamilton. For the above reasons, I would not urge the necessity of largely increasing the hospital accommodation at St. George's, but a hospital would have to be constructed on Prospect Hill, and, like the barracks, must be well raised from the ground, and be surrounded by a broad and lofty verandah. It should be calculated to hold at the least ten per cent. of the force in barracks.

I now beg to state what in my opinion is the best course to pursue in the event of a future epidemic visitation. On the appearance of the first case of yellow fever, either in a town or in any barrack, the whole of the troops in the vicinity should be instantly removed, and placed under canvas, at a distance of at least two or three miles, if possible. Experience has proved that of all camp grounds, that situated at Ferry Point is the healthiest; it therefore should always be the first occupied, and the troops should be impressed with the necessity of keeping the ground perfectly clean and unpolluted. The privies must be placed over the sea, so that the excreta are at once carried away. This matter was very carefully attended to during the late epidemic, and I believe it was greatly owing to the watchfulness of the medical officers, that the camp proved so healthy.

On the appearance of a second case anywhere, instant steps should be taken to remove the white troops to Halifax, beginning with such portions of the force as appear to be in the greatest danger. It would be an excellent measure if a man of war steamer were kept off Ireland Island every summer, in case her services should be required. The defence of the islands during the absence of the troops might with safety be entrusted to the Royal navy. The withdrawal of the white portion of the garrison is by far the most prudent arrangement, particularly when we consider that there are no mountainous districts, as in Jamaica, to which the troops could be removed, and where they would be almost beyond the reach of the epidemic influence. But if convicts are again sent to Bermuda it might be said that it would be impossible to send away the white troops.

This difficulty is not insuperable. It may be considered cruel to send convicts to a place where they stand a chance of being more than decimated by epidemics, but it is equally or more cruel to keep soldiers in such a climate merely to guard the convicts. I therefore propose to remove both in the event of another visitation. Instead of sending out the convicts in old rotten hulks, I would transport them in sound wholesome ships, possessing good sailing qualities, and take care that they are maintained in proper sailing trim. It would entail some additional expense, but to this the English nation would never raise objections. It must never be forgotten that whenever an epidemic drives the troops out of St. George's or elsewhere, the hospital establishment, and, in fact, every one connected with the military, must leave at the same time. The sad experience of the late epidemic must not be thrown away. The necessary arrangements must be made quickly, for the pestilence may fall upon us when we least expect it. A temporary wooden structure should be built near the camp-ground at Ferry Point, to be used as a hospital for 30 patients; the best site would be on the high ground to the north of the peninsula. A bakery near the same spot, a commissariat store and office, and also a purveyor's store and office, would be necessary. All might be built of wood at a small expense. I recommend that the actual camp ground is kept clear of buildings.

Dockyard guard.

We must not forget the mortality among the troops at Ireland Island during the epidemic of 1853 and 1864 caused by the continuance of the dockyard guard. A provision should be made, so that the guard may be instantly abolished on the demand of the senior medical officer, and the officer commanding the troops.

Period of the year to send out drafts.

It is a matter of considerable importance to determine the best period of the year at which to send out "drafts" from England to this Colony, or regiments from any other station. If the "drafts" left England in the beginning of November, it would be fully known at home whether there was any epidemic prevailing in Bermuda. The troops would also, on arrival, have the cold season before them.

Printed instructions.

Printed instructions should be sent from England, pointing out exactly what course is to be pursued by officers of all departments, both in the anticipation, and in the event of an epidemic outbreak. It is of the greatest importance that every thing should be systematically arranged beforehand; for it is found that when the pestilence suddenly appears, a state of excitement and confusion prevails by which individual judgment is apt to be influenced, and perhaps overawed. The instructions should be so framed as to relieve officers from responsibility as much as possible, and every officer on arrival in Bermuda should be furnished with a copy.

The Reports of the Commissioners on the outbreaks of yellow fever in 1853, 1856, and 1864, should be supplied to officers commanding corps, or in charge of Civil Departments. Each medical officer should also be furnished with them on arrival in this command.

(signed) *T. W. Barrow,*
Deputy Inspector General
of Hospitals, Bermuda.

18th June 1865.

ANSWERS of Surgeon Major *Grant*, Principal Medical Officer.

1. There is reason to suppose that an unfavourable influence was exerted on the military station at St. George's, by the extremely unsanitary condition of the town, which lies immediately under it.

2, 3, 4. These can be best answered by medical officers of regiments.

5. The supply of water was from rain collected in tanks; its quality was good, and its use unrestricted.

6. No information.

7. It appears that they were. Men sent from the Ferry to St. George's were attacked in large numbers; and the dockyard guard at Ireland Island, which was kept up long after Surgeon-Major Barrow had recommended it to be discontinued, was the cause of many lives being sacrificed. There ought to be a proportion of black troops in this command.

8. The cubic space per man in hospital, allowed by regulation in this climate, is 1,500 feet, and by that measurement the military hospital at St. George's is capable of accomodating 23 patients, or 3·9 per cent. of the strength. This proportion is much too small, 10 per cent. being allowed by regulation.

At the time of the greatest crowding, the highest number in hospital was 103, and the cubic space per man 349 feet. This does not include the verandah or tents, which relieved the pressure a little; but during the height of the epidemic the pressure was extreme.

9. During such overcrowding, ventilation was of course imperfect. The ventilation of the hospital is chiefly effected by doors and windows placed opposite each other, and these means could not, I believe, be fully used, as it was found that the sick could not be exposed to draughts without injury.

There is not sufficient force of water to flush the water-closets and drains of the hospital properly, and this defect could be best remedied by having a force-pump, worked by a windmill, to raise water from the sea.

The sea water thus obtained might be also advantageously used for baths. The latrine of the hospital is badly constructed; it is built over an open drain leading to the sea, and washed by the tide. The foul air is thus forced backwards, and taints the surrounding atmosphere.

The water supply is from the rain-fall, and is of good quality, but insufficient in quantity, having become exhausted during the late epidemic, and again during the drought of this year, when no unusual demand was made upon it.

10. No information.

11. No information.

12. Most beneficial.

13. No information.

14. No information.

15. No information.

16. I have no experience in the treatment of yellow fever, but from what I have read of its symptoms and pathology, two remedies suggest themselves to me. The first of these is sulphuric acid, properly diluted, and applied to the surface. Used in this way, I consider that it might keep the pores open by its action as a topical application, while it exerted its therapeutic influence as an antiseptic, and restrainer of exhausting perspiration by absorption.

The other remedy is oxygen, freely mixed with the atmosphere, inhaled. This gas, which is the acknowledged vivifier of the blood, is easily prepared, and might, without difficulty, be made to bubble through one or more pneumatic troughs placed near the patient's bed, or it might be administered at intervals in a more or less diluted form by inhalation.

17. No information.

18. The meteorological observations which are generally recorded in the principal medical officer's office were unavoidably suspended during the epidemic, owing to the illness of the meteorologists, and from other causes.

19. In reply to this question I append the recommendations which I have lately made to the Commanding Royal Engineer.

The sanitary condition of towns must of course affect that of neighbouring military stations, and in this command attention to cleanliness, drainage, ventilation, and the general sanitary condition of towns, requires to be strictly enforced by municipal legislation. The chief improvements required to the towns in Bermuda, and especially to

St. George's, are, wider and more regular streets, scavengerage, drainage, both deep and surface, and the strict prohibition of accumulations of filth in ashpits, cesspits, pigstyes, stables, cellars, &c.

But it is unnecessary to particularise; sanitary science is now so generally understood, that it requires only well-directed legislation to enforce its requirements.

I must not omit to notice defective water supply as most deleterious to the health of the community. With ordinary foresight, the towns of Bermuda ought never to suffer as they do at present from scarcity of water. One or more large public reservoirs should be made, and no dwelling-house, however small, should be allowed to be built without a tank of proportionate size being attached to it.

Besides the state of the towns, it may be a question whether the aspect of the country at large might not be improved; whether these large lagoons that are met with, especially in Hamilton and Somerset Islands, might not be reclaimed by erecting sea-walls, as is done in many of the low-lying districts in England.

Experience shows that febrile affections, particularly those of an intermittent and remittent type, diminish in the ratio of cultivation, and it might be well to bear this fact in mind when legislating for the healthiness and general prosperity of these islands.

J. M. Grant, M. D., Staff Surgeon Major,
Principal Medical Officer.

St. George's, Bermuda,
10th June 1865.

RECOMMENDATIONS of *J. M. Grant*, Esq., M. D., Staff Surgeon Major, Principal Medical Officer at Bermuda.

1. As there is no land in Bermuda sufficiently elevated to be beyond the influence of miasmatic poison, it is very desirable that immediately on the appearance of yellow fever the whole of the white troops should be moved to Halifax, sufficient naval transport for that service being detained every summer.

To carry out this measure it would be necessary to have a sufficient number of black troops in garrison; and they might, in ordinary years, be advantageously employed, to spare the Europeans fatigue, messenger duties and the like, during the hot season.

2. Increased accommodation in Royal barracks for officers and men.

3. The wall in front of officers' quarters, Royal Barracks, to be pulled down, and the ground lowered so as to improve the ventilation of the basement.

4. A new barrack for the Royal Engineers, and additional quarters and mess accommodation for officers, Royal Artillery and Royal Engineers.

5. Married soldiers' quarters much required.

6. Additional tanks in Royal Barracks, or a communication between the existing tanks and the large reservoir at Fort Victoria.

7. A prisoners' room in Royal Barracks, that under the guard-room being damp, and unfit for use.

8. An improved system of drainage, capable of being regularly flushed, and the abolition of cesspits.

9. A new site for the cemetery; the present cemetery is over-crowded, and in objectionable proximity to the Royal Barracks, the hospital, and Fort Albert.

10. Increased hospital accommodation, including space for wards, surgeries, stores, kitchen, bath and ablution room, dead-house, &c. The present hospital arrangements are most defective.

11. A larger airing ground, furnished with seats for the patients; the adjoining cedar plantation might be made available.

12. The removal of the present rifle-butt, which is too near the hospital; the firing disturbs the patients, and there is a risk of accident.

13. Hospital privy badly constructed; the sea wash being upwards through the soil-pit, the foul air is forced back, and even the waste paper is blown upwards and scattered about in all directions. The soil-pits should be flushed downwards, and its orifice contracted, and fitted with a hinge-valve, to prevent the back current through it.

14. A windmill is required, to pump water from the sea into a tank sufficiently large and elevated to flush the water-closets, drains, and privies of the hospital, and to supply water for baths, which there should always be the means of heating. I consider this work most urgently required. A sufficient number of hot and cold baths is essential to an hospital at all times, but especially during epidemic visitations.

15. Additional tanks much required for the hospital. The present tanks have been empty for about 14 days.

Ireland Island.

1. Ashpits required at different places near the quarters.

2. Married soldiers' quarters too small; two rooms should be thrown into one, and additional windows opened at the back.

3. A verandah is very much required along the front of the married soldiers' quarters.

4. The urinal at Casemate Barracks to be lowered, and the waste water from the ablution room made to flush it.

5. The women's privies should be thrown out about 10 feet farther, and the soil should fall upon an even surface, sloping towards the sea, not into a shallow pit, as at present.

6. A better aired and lighted canteen required.

Boaz Island.

1. A windmill to pump water into a tank sufficiently large and elevated to flush all the drains and water-closets much required. The drains should also be fitted with hinge-valves, where they open above low-water mark, to prevent the foul air being blown backwards. This work is most urgently required, Boaz Island being so flat that it is impossible to flush the drains without a full stream, and considerable pressure of water.

2. A women's wash-house and drying ground much required.

3. An ablution room for men, and one for women, required.

4. A cook-house attached to married soldiers' quarters much required.

5. Wooden bed-cots required in the cells. At present the prisoners lie on the floors, the cells having been originally constructed for hammocks.

6. A verandah required in front and rear of medical store and storekeeper's quarter.

7. A door to be opened in the wall nearest the landing-place, for the convenience of receiving and issuing stores.

8. A kitchen range required in the storekeeper's quarters, and fireplaces in the two rooms set apart for surgical instruments and materials.

9. A verandah required in front and rear of the hospital, also an enclosed airing ground (furnished with seats) for the patients, and a privy overhanging the sea.

10. A sergeants' quarter, orderlies' room, and dead-house required. The present dead-house is too distant.

11. Gas should be introduced into the canteen, and all barrack rooms and officers' quarters.

Note.—Recommendations 6 to 11 have no special bearing upon the healthiness of the locality.

Watford Island.

1. Guard-rooms and prisoners' room too small; the two should be thrown into one, and another prisoners' room built.

2. The cook-house requires an open ridge at the roof.

3. The gas-works are unwholesome in their present state. The retort room requires to be enlarged and heightened, and it should have an open roof ridge, to allow the escape of noxious gases when the retorts are cleaned.

4 A larger tank is required, with a pipe to carry the overflow of foul water into the sea; and arrangements should be made to barrel off and remove the tar.

5. A stage is required from which to empty the ashes into the sea.

6. The old gas-holder should be refitted, and kept as a reserve, or removed altogether. It is offensive and unwholesome in its present condition.

GENERAL RECOMMENDATIONS.

1. Bathing houses at the edge of the sea, and as near the barracks as they can be conveniently placed, should be erected for the men, officers, and women and children at all stations in the command.

2. A skittle alley, properly roofed, and a double racket court, also roofed (one compartment for officers and the other for men), required at each station.

3. Stoves or fireplaces should be put into all barrack-rooms. Fire is often necessary to comfort, and it is much required to air the rooms, clothing, and bedding, when the atmosphere is loaded with moisture, although the temperature may be high. This should be kept in mind when constructing new barracks.

4. A temporary hospital and purveyor's stores should be built at Ferry Point, and at such other sites as may be selected for sanitary camps during epidemics. Water tanks would also require to be made, if not already constructed.

5. The manufacture of gas, and its use for lighting barracks at all stations in the command, would be of very great advantage to the troops.

This recommendation has an indirect bearing only on the health of the troops. It is presumed that by making barrack-rooms more cheerful, the attraction to low pot-houses might be diminished.

ANSWERS of Surgeon Major *Cogan*, 2d Battalion 2d Regiment.

1. ON the arrival of the 2d Queen's at this station from Gibraltar, on the 16th July 1864, the general sanitary condition in and about the town of St. George's was most unhealthy. In the first place, the police force was very defective, there being only three or four men in commission to suppress riots and other irregularities taking place consequent on the extraordinary number of drunken blockade runners who infested the streets, both by day and night. Very little attention was paid to the cleaning of the streets, and the odour emanating from all this refuse matter lying about was most unhealthy for the troops.

2. The barracks were vacated on our arrival, the 39th Regiment having gone under canvas previously. The 2d Regiment also went under canvas at St. George's, and remained so until the 1st August, when they were removed to Ferry Point. Each barrack-room was, a short time ago, supposed to contain 23 inmates, giving a cubic space of 500 feet per man. Sixteen men is the regulated number now for each room, giving a cubic space of 750 feet per man, which is not sufficient.

3. The means of ventilation consisted of two windows and a door in front and rear of each barrack-room; three open windows in the wall or partition separating one room from the other, and ventilators on a level with the floor and ridgeway. The men not having slept in the barrack-rooms during the epidemic, no notice was taken of the state of the air.

4. The drainage, sewerage, &c. were and are at present in a very defective state, chiefly in consequence of the constant supply of water for flushing; the air about the barracks was and is most unhealthy and disagreeable, the wind at the outlets of the drains blowing up all the foul air collected in them.

5. The water supply, at the commencement of the epidemic, was sufficient, and of pretty good quality, there being very little demand for it, as the troops were out at different encampments where there were tanks. It is rain water, collected chiefly from the housetops in tanks, which are generally very badly constructed, under the barrack-rooms, guard-rooms, and officers' quarters.

6. Intemperance in general did not prevail among the men before leaving Gibraltar. On arrival at that station, there was not one man admitted into hospital arising from drunkenness before the appearance of yellow fever, as almost all of them had been sent away from St. George's, and no case was reported for a long time after.

7. I regret to have to state that the exposure the men of the 2d Queen's were put to on our arrival at this command was most injurious to their health; they were for several days employed in carrying their own and the officers' baggage from the wharf to where their tents were pitched, and they were engaged in erecting these tents throughout the entire day, under the influence of a hot burning sun, being the means of occasionally causing them to resort to dram drinking, chiefly rum, which was cheap and nasty, and which acted in a most deleterious manner on their constitutions. There were many of these men, employed as above mentioned, reported themselves to me in the morning at the hospital, soon after our arrival, suffering from the same primary symptoms as those of yellow fever; but I treated them as if the cause was from exposure to the sun and too much rum.

8. The hospital accommodation, previous to the epidemic, was ample for our regiment; but soon after its appearance the old artillery hospital was given up, and half of the present building handed over for the use of the Royal Artillery and Engineers, which allows of only 12 patients, with the orderlies, in each division. The cubic space allowed to each man before the epidemic was 1,296 feet; during the greatest crowding it was 363 feet per man, many of the men having to lie on the floor and in the verandah.

9. The means of ventilation were perfect in the wards, but, unfortunately, there was a great deficiency of circulating air during the time the epidemic existed. The drainage was not at all good, particularly in the privy, there being no spare water to flush the

drains. The water supply is seldom sufficient in the summer months, when carts are employed for its conveyance.

10. All the men were sent out under canvas immediately on disembarkation, consequently the barracks were not occupied by them. They were first encamped about half a mile to the north of the town, and remained there a fortnight on the appearance of the fever. I recommended their removal to Ferry Point; that is, when there was no doubt about the nature of the epidemic. The date of encampment at St. George's was the 16th July, and the 1st August at Ferry Point. The reason the 2d Regiment first went under canvas was in consequence of the 39th Regiment having vacated the barracks a few days previously, for the purpose of having them cleaned out for our reception.

11. (A.)—The 39th men encamped immediately at the back of the barracks, facing north-east; the Royal Artillery and Royal Engineers and the 2d Queen's were about half a mile to the north of that, a very healthy and airy locality, all about the different forts, which were well elevated.

(B.)—There were 82 men of the Royal Artillery, 119 men of the Royal Engineers, and 280 men of the 2d Queen's; the ground was spacious, and there was no overcrowding.

(C.)—Bell tents, most of them with double lining.

(D.)—There were three men for each tent, each man having an iron bedstead. The cubic space in each tent was 157 feet.

12. When they were first encamped near the town the same regularity could not be observed as in barrack rooms, consequently the men had greater advantages of going into town after hours, and drink. The effect of encamping at Ferry Point was most sanitary, as there was not a case that occurred out there but could be traced to St. George's, many of the men having to come in for duty at first, but afterwards for provisions, &c.; no case occurred amongst any of them who did not visit St. George's after encamping at Ferry Point; that of the bandsmen is a good proof, as they were never sent into St. George's on such fatigue duties.

13. There were nine officers and 253 men sent on board ship in September for Halifax, which had a most beneficial effect, as no case of fever occurred among them.

14. The barracks were undergoing sanitary improvements at the outbreak of the epidemic for the occupation of the 2d Queen's, such as lime-washing, painting, cleansing, &c. The drains, cesspits, urinals, &c. could not be much improved without making them all new. There was no stagnant water, and the cesspits were kept constantly cleaned.

15. On the first appearance of the yellow fever in the hospital I had all the patients not suffering from it sent out under canvas. There were 15 patients sent out, but as they were almost all minor cases of surgery, no particular notice was observed.

16. The best plan of treatment that I observed was good nursing and little medicine. The first symptoms to be attended to were to clean out the bowels, and if the stomach was any way irritable, to use the enema; a warm bath at the commencement, and to keep up the action of the skin with small doses of James' powder and nitre; the latter also acted on the kidneys, which should be always particularly inquired about regarding the quantity of urine passed. The patient should not be allowed anything in the shape of food, except cold and mucilaginous drinks. No solid food of any description should be allowed to them, although they will beg and entreat of you to give them something to eat, the desire of food being so great: a great number of cases of deaths occurred by the injudicious administering of food before convalescence properly set in. In the after treatment, citrate of quinine and iron was one of the best tonics, and I have known patients to improve wonderfully on beer, and to like it better than wine or any other stimulant. Light and nourishing diet to be gradually given as the case required it.

17. The 2d Battalion, 2d Regiment (Queen's), I am alluding to in particular, were landed at St. George's, 16th July 1864.

18. I cannot furnish any meterological data.

19. Barracks of a different description to those at St. George's should be erected for troops in such a warm climate as Bermuda; they should be large and lofty, with large windows, and well ventilated, not to have the barracks in one long row of buildings, but more separated, and the spaces between them a good distance, to allow a thorough circulation; the outbuildings should also be more separated from the barracks. I would also suggest that no inhabited building should be placed over water tanks.

A great improvement could be made in the officers' quarters. What I would suggest first, I am afraid would not be attended to, namely, pull them all down and build new ones, or allow the old ones to remain for some other purpose. There should also be more married officers' quarters, as the present accommodation is not sufficient.

The quarters at present occupied by the officers are of the same height and on a line with the barracks, and are most defective and injurious to health; each officer is entitled to only one room; the front rooms are bad enough, but the back rooms are so small and badly ventilated that I consider it most dangerous for any one to continue living in them, particularly during the summer months.

The hospital accommodation is entirely too limited; an addition of two wings have been recommended, but they have not yet been commenced. I consider it very necessary that the works should go on at once. There is a great deficiency in the medical officers' department, the surgery being so small that the room is insufficient to contain the ordinary amount of medicine in general use, and when the annual supply arrives, everything has to be thrown on top of one another. I must state that in this same surgery the medicine is compounded, all returns and reports made out, all minor surgical operations are made, and if a large or great operation were to take place it should be done in one of the wards in front of the patients'; the out-door patients have also to be attended to in this surgery. About one-third of the men should be encamped at the beginning of every summer at the usual camping ground near the town; to be regularly relieved; and in the event of better air being required, they should be sent to Ferry Point; but if an epidemic of any description should again visit us, I would strongly urge the necessity of having as many of the men as could possibly be spared sent out to sea. In general, the drainage and water supply are very good when the men have been encamped; this subject does not require any recommendation.

In conclusion, I would strongly recommend that no European troops of any description should be allowed to remain in Bermuda longer than three years.

(signed) *F. Cogan*, Surgeon Major,
2d Battalion 2d Regiment.

ANSWERS of *B. Burland*, M.B., Assistant Surgeon, Royal Artillery, in Medical Charge of Royal Artillery and Royal Engineers.

1. I CANNOT say to what extent, but I can easily conceive that the close proximity of latrines and cess-pits, especially at Fort Victoria and the Old Sappers' Barracks, may have acted prejudicially on the health of the men.

2. Royal Artillery:—

Fort Victoria, average cubic feet per man	= 600
Fort Catherine	= 1,474
Fort Cunningham (guard-room)	= 517
Fort George	= 708
Royal Engineers:—	
Old Sappers' Barracks	= 748
Fort Albert	= 751

3. Windows and doors. In the forts, in addition, gratings in the upper floor; in all, more or less foul; in Fort Victoria almost intolerable.

4. Drainage very imperfect; cesspits with urinals leading to them. At Fort Albert, a privy, flushed by the overflow from a tank; the sewage being carried by a drain leading into the sea. All the cesspits were thoroughly emptied in the spring, and lime and other disinfectants daily used. Their sanitary state was much more satisfactory than in any former year, but notwithstanding every care, owing to the nature of their construction, considerable nuisance was experienced, more especially at Fort Victoria, where a privy and urinal, within the outer walls, on the south side, is always offensive, and particularly so during the prevailing S. and S.W. winds.

5. As in former years, rain-water collected in tanks; quality good, quantity ample, used by the men *ad libitum*. No influence exerted by these circumstances.

6. I do not think that intemperance prevailed, before the epidemic, to any greater extent than usual. During its prevalence, and afterwards, drunkenness and its consequences were more general; at this station spirituous liquors are very freely consumed by the troops.

ROYAL ARTILLERY and ROYAL ENGINEERS' Admissions into Regimental Hospital for Intemperance to 30 June 1864.

INTEMPERANCE.	For the Year ending 1863, 31 December.			For the Half-year 1864, ending 30 June.		
	Royal Artillery.	Royal Engineers.	TOTAL.	Royal Artillery.	Royal Engineers.	TOTAL.
Directly	8	21	29	4	19	23
Indirectly	8	7	15	5	2	7
TOTAL	16	28	44	9	21	30

7. The constant exposure of the Royal Artillery and Royal Engineers in the execution of the various garrison and regimental duties, such as grave-diggers, orderlies, bakers, bargemen, carters, &c. &c. must have added fearfully to the number of attacks and deaths, as these duties necessarily detained the men more or less in St. George's, the very focus of disease.

8. Miserably insufficient. In the Royal Hospital (the only hospital at St. George's) accommodation is provided for only 12 sick of the Royal Artillery and Royal Engineers, including two orderlies; and the same amount on the other side of the building for the infantry. On the 27th August there were no less than 62 Royal Artillery and Royal Engineers (Royal Artillery 33, and Royal Engineers 29), on the sick list, of whom 42 were then under treatment in the three wards allotted to the two corps (independent of the sick of the 2d (Queen's) Regiment on the opposite side), and 20 were under canvas. At this period, the cubic space per man was about 363 cubic feet.

WARD.	Cubic Space.	Constructed for.	No. of Patients 27th August.	Nurses, &c. 25th August.	Total Nurses and Patients.	Cubic Space per Man.
Left Wing of Hospital:						
No. 2 (large)	10,768	7	25	4	29	371
No. 4	5,820	4	15	3	18	323
No. 2 (small)	1,569	1	2	1	3	523
TOTAL	18,157	12	42	8	50	363

18,157 ÷ 50 = 363 cubic feet per man.

9. The system of ventilation was good, but the over-crowding was too great to allow under almost any circumstances, a constant change of air. Drainage and water-closets very defective. The water supply failed altogether in August. The tanks are too small, so that after a long drought, water for hospital purposes must be carried in barrels from the naval tanks.

10. On the 18th July Fort Victoria was evacuated, and the Royal Artillery encamped on the glacis. On the same date the permanent camp of the Royal Engineers, adjoining their barracks, was increased to two-thirds of their strength, and shortly afterwards the remainder of the Royal Engineers in St. George's were also under canvas. On 15th, 16th and 17th August the Royal Engineers and Royal Artillery encamped on the glacis at Fort Cunningham. The Royal Engineers' convalescents returned to St. George's on the 9th November, the Royal Artillery returned to Fort Victoria the 17th November. The Royal Artillery at Ireland Island moved out of the Casemate barracks, and encamped on the glacis of the works, on the 25th August.

11.—

(*a*) ENCAMPMENTS.	(*b*) Royal Artillery.	(*b*) Royal Engineers.
	No.	*No.*
Glacis of Fort Victoria	82	—
Glacis of Fort Cunningham	67	76
Glacis of Ireland Island	80	”
Permanent Camp near Sappers' Barracks	”	119
Permanent Camp near Walsingham	”	9

12. (*c*) In each encampment double bell-tents were provided for the men, and marquees for the officers. (*d*) Three men in each tent, cubic space per man 157 feet. I believe that many lives were saved by this measure, by preventing exposure to the deadly atmosphere of St. George's, and I consider that when the disease was contracted at St. George's the cases were more malignant and fatal. The site at Ferry Point was most healthy, as I believe it can be proved that few, if any, indigenous cases of fever occurred there. The cases of Assistant Surgeons Killery and Lloyd, as compared with those of Surgeon Clarke, and Assistant Surgeons Millroy and Youell (all of whom arrived in Bermuda under the same circumstances), serve as an illustration of this fact. The former, stationed at Ferry Point, were not even attacked, whilst the three latter all contracted the disease in St. George's, and died. That fatal cases occurred in the camp at Fort Cunningham, does not, I think, prove the insalubrity of the site, as the men before encamping there were already saturated with the poison, and their trying and arduous duties necessarily exposed many of them daily to the infection of St. George's.

13. On the 9th September, eight officers and 201 rank and file of the 2d Queen's sailed for Halifax in Her Majesty's Ship "Galatea."

On the 24th September 70 Royal Artillery and two officers, 67 Royal Engineers and one officer, and 51 second battalion second Regiment, and one officer, again sailed in the same ship. On the passage four men died, one Royal Engineers, one second battalion second Regiment, and two seamen, and one Royal Engineer died in a week afterwards in the Royal Naval Hospital, Halifax. The voyage must have had a most beneficial effect, if only in cheering the drooping spirits of the men, and sparing them a repetition of the sickening sights which they had been daily called upon to witness. No sick embarked; those who died were attacked after embarkation.

14. The barracks which had been regularly lime-washed were evacuated, disinfectants were freely used (the cesspits had been emptied in the spring), and all ash-pits and urinals were closely looked after, so that no stagnant water should collect. Coffee was served out to the men early in the morning, and at the suggestion of Surgeon M'Swiney, Royal Navy, rum and quinine were also administered.

15. Convalescent patients only were camped out about the 18th August on the glacis of Fort Victoria. This encampment was broken up on the 26th August, and the marquees removed to the former site at the hospital, as many relapses took place in consequence of the indiscretion of the patients, and the want of proper surveillance, owing to the insuperable difficulty of procuring assistance. On the 27th August there were 20 convalescents of the Royal Artillery and Royal Engineers in this camp. No acute cases were treated in this camp, but the results at Fort Cunningham, where a few cases were treated, were quite the same as in hospital.

16. No special mode; the treatment was most varied, each case requiring different remedies, as different symptoms demanded; as a rule, the treatment commenced with warm baths or pediluvia, with castor oil, followed by mild vegetable diaphoretics. To sustain a mild diaphoresis was the general indication. Segregation and judicious nursing were of the first importance.

17. Royal Artillery and Royal Engineers, January 1862.

A draught of 32 Royal Artillery on 25th October 1863.
Second battalion 2d Queen's Royals, 15th July 1864.

18. *Vide* answer No. 19, question No. 1, as health officer; east end.

19. I consider the barrack accommodation totally unfit for a climate such as Bermuda; barracks should be built on arches, lofty, and as detached as possible. to ensure a thorough ventilation, All the forts I consider as utterly unfit for habitation, except in time of war. The system of cesspits is most objectionable; privies might be flushed by sea water, raised by steam or a windmill, or the soil might be removed in trays, moving on a tramway, as in the camp at Aldershot. Ash-pits should be covered from the sun, with free access to them, and should be emptied more frequently than at present; 700 cubic feet per man is the least which should be allowed in barracks. Proper lavatories and baths, with water laid on, should be provided.

The hospital accommodation is altogether insufficient; provision should be made for at least 10 per cent. sick; proper married quarters and means of rational amusement, such as a good racquet and fives court, and a well-ordered institute, should also be provided, which I am convinced would much reduce the tendency to habits of intemperance and consequent disease and crime. On the earliest appearance of yellow fever, I consider that the troops should be removed to Halifax, and that, failing this, they should be immediately encamped on the most favourable sites, and all communication with an infected district strictly cut off.

Finally a detachment of coloured troops stationed in St. George's, would, in the event of another epidemic, garrison the Islands, and in ordinary years undertake the various fatigue duties now performed by European troops.

(signed) *B. Burland*, M.B., &c. &c.,
Assistant Surgeon, Royal Artillery.

St. George's, Bermuda,
1 June 1865.

St. George's, Bermuda, 28 June 1865.

Gentlemen,

After mature deliberation, I beg to enclose, for your consideration, a few suggestions submitted on the 17th July (the day on which Williams, the second fatal case, died) to my commanding officer, Col. G. Graydon, Royal Artillery, and request that you will be pleased to add them to my answer to Question 10, No. 2.

I have, &c.
(signed) *B. Burland*, M.B.,
Assistant Surgeon, Royal Artillery,
In medical charge of Royal Artillery and Royal Engineers.

S. B. Gray, Esq.,
and Fever Commissioners.

ANSWER to Question 10—*continued.*

On Sunday, 17th July, the day on which Williams (second fatal case) died, Col. G. Graydon, Royal Artillery, commanding at St. George's, consulted me as to what steps should be taken in the event of an epidemic then imminent.

I strongly recommended—

1st. That the 2/2nd Regiment should be removed from the naval tanks, and be encamped at Ferry Point, as suggested by Dr. Hunter, civilian practitioner.

2dly. That the 39th Regiment should leave St. George's without delay, and be encamped on the glacis of the works, Ireland Island.

3dly. That the women and children of the 39th Regiment should be removed at once from St. George's. This was done next day, Monday, 18th July.

4thly. That the Royal Artillery and Royal Engineers should be placed under canvas on the glacis of St. Cunningham.

5thly. That all communication with the town of St. George's should be cut off, and sentries posted for that purpose.

6thly. That all the patients of the Royal Artillery and Royal Engineers should be removed to the Royal Hospital from the old Royal Arsenal Hospital, ordered by the Home Authorities to be vacated in any case by 1st September 1864. This was done on August 2d.

7thly. That all garrison guards should be done away with.

8thly. That the public works should be suspended.

9thly. That all regimental sentries should be supplied with coffee during the early morning.

These nine suggestions, were, I believe, submitted to Col. Munro, C.B., Commandant and Lieut. Governor, then residing at Mount Langton.

B. Burland, M.B.,
St. George's, 28 June 1865. Assistant Surgeon Royal Artillery.

ANSWERS of Lieutenant *Gorham*, Royal Artillery, Acting Barrack Master.

1. It is scarcely possible to say to what extent the health was injured; but, doubtless, the filthy state of the town of St. George's aggravated, if it did not originate the disease.

2. The cubic space per man for which the barracks are constructed can be most correctly furnished by the Royal Engineers. The rooms were not occupied by anything like the number authorised by the construction.

3. I think all the barracks sufficiently ventilated, except the Royal Barracks. The married quarters in 1st Bastion, Ireland, are too small, and require extra windows at back, to improve ventilation.

4. The latrines, with few exceptions, fall into cesspits, which are emptied as required, by a contractor. The drains at Boaz caused great annoyance.

5. The water supply consisted of rain water collected in tanks, and was fairly good. There was an abundant supply last summer. Such, I believe, is not always the case. To the latter portion of this question I would reply in the negative.

6. I do not think so. Habitual drunkards appeared to escape. Those suffered most who either drank more or less than they had previously been accustomed to take.

7. Yes.

8. Notoriously insufficient at St. George's. At Ireland they were, with very few exceptions, sent to the naval hospital.

9. Unanswered.

10. Wholly, with exception of some men kept at the Royal Barracks for necessary duties; these were afterwards removed.

11. *a.* The Royal Artillery and Royal Engineers at Fort Cunningham Head Quarters;

2/2d Regiment at Ferry Point; Royal Artillery on glacis, at Ireland, afterwards moved to Gilbert's Store, and thence to Boaz. Detachment of 2/2d Regiment at Boaz.

b. Numbers roughly estimated at—

Fort Cunningham	190
Ferry Camp	350
Ireland	80
Boaz	250
Total under canvas	870

c. Bell tents without floors. Barrack bedding, and bedsteads or trestles and boards.

d. Three men per tent.

12. Beneficial. I think that, when practicable (as at Boaz), the barracks should be used as day rooms and for meals, and the tents to sleep in only, as, when the sun is on the tents, they are most oppressive. I think sleeping out is beneficial.

13. September and subsequent trips. The removal doubtless saved a great number; some who probably had been impregnated with the poison before leaving took fever on the way, and these, I believe, generally died; but most of them came back looking uncommonly well.

14. Barracks and quarters were lime-washed; ash and cesspits were kept as clean as possible, but great trouble was found in making the contractor do his duty. A new contract has been made, which is working better.

15. Unanswered.

16. I believe if the first symptoms of attack be attended to, most would recover. As an unprofessional observer, I should say the best treatment is,—take a hot hip bath, with mustard in it, keeping the body well covered with blankets; take an opening dose or an enema; get into bed, and cover with blankets till a profuse perspiration breaks out; continue this some time, and to relieve thirst, drink warm sage tea or barley-water, in small quantities and frequently. Iced drink is bad; so is an acid drink, like lemonade. Wet cloths will relieve pain in the head, and an iced sponge passed over the face gives great relief. The blankets must be very gradually diminished in number. When recovering, be particularly careful not to eat any solid food, however great the craving, as the stomach cannot bear it, and the worst results follow.

17. The Royal Artillery and Engineers had been here since 1862. The 2/2d Regiment arrived in July 1864.

18. Unanswered.

19. More hospital accommodation is required. Cottages required for married soldiers at St. George's. There is no gymnasium or similar place of amusement for the men. One at each end of the islands would be desirable. Officers' quarters are much required at St. George's for all branches of the service. In the Royal Barracks there are only small, low, ill-ventilated rooms, all on the ground floor, and only one allowed to each officer. In Fort Victoria there are only single rooms, with stone floors, no kitchens; access is gained to the officers' rooms by passing through the soldiers' barrack rooms, and the windows open on a blank wall at a very few feet distance.

The drainage at Boaz Island is very bad indeed, and requires immediate attention. There is no fall in the drains, and they do not fall into the sea by the shortest route, by which fall might be gained. In the time of the convicts they used to be flushed by manual labour every afternoon. This being now impracticable, they do not act. Good tiles should be used for the drains, and not porous stone. Some means of flushing them is required. I have heard a windmill suggested for raising sea water for this purpose. Water is raised at the naval hospital close by in this manner. There is a drain connected with the urinals and washhouse at the Casemate Barracks, Ireland, which requires alteration; it becomes stopped, and very offensive every summer.

I think the best thing would be to have a summer barrack built on the most healthy site that can be found, say Prospect Hill, to which the troops could be moved during the summer months.

(signed) *C. A. Gorham*, Lieutenant, Royal Artillery,
Acting Barrack Master.

1 June 1865.

ANSWERS of *Park Benjamin Tucker*, Esq., M.D.

1. The sanitary conditions of the barracks and outbuildings are very defective, and liable to prove injurious to Her Majesty's troops, as will be proved by the report of Fever Commissioners.

4. Defective.

7. Yes.

8. Too limited.

12. Very beneficial.

16. I can only answer this question, after many years' experience, as the most successful in my own practice. As a general rule, for adults, in the first instance, a warm bath, for the purpose of softening and cleansing the skin; at the same time keeping the head cool by removing the hair, and cold applications. Should the headache not be relieved, and the subject a plethoric one, leeches may be applied with a very good effect to the temples or behind the ears. After the bath, the body to be carefully covered with blankets, at the same time attending to free ventilation. If the patient is seen within 12 hours after the attack, an ipecacuan emetic relieves the stomach of any foul matter that may have been retained, as digestion is entirely suspended. The emetic has also a tendency to induce perspiration, relax the bile duct, and often acts as an aperient, which is to be desired. After the action of the emetic, if the bowels have not been acted on, an enema of soap and water, varying at times the potency of same as circumstances may demand. Should the enema not act sufficiently, and the stomach be retentive, a small dose of castor oil or rhubarb should be administered. To allay thirst, water, barley-water, or a beverage of cream of tartar, sweetened, may be allowed. Should pain in the stomach or bowels be complained of, warm mustard or bran poultices afford great relief. Frequently, after the second day, a sense of hunger, with sinking, is felt, for which thin arrow-root and the white of raw egg prove efficacious and grateful.

Often great irritability of the stomach is present, and much to be dreaded. For relief of same, five-drop doses of laudanum, in a teaspoonful of cold water, given every hour, has proved more efficacious than any other drug. It acts as a sedative to the stomach, stimulant to the system, promotes perspiration, and often relieves the watchfulness so frequently complained of. Larger doses would be injurious. On the third and fourth day of attack, hæmorrhagic symptoms frequently appear, indicated by swollen and scurvy-like looking gums, and great prostration. In this stage I have administered, with great success, two-grain doses of citrate of iron and quinine, in a teaspoonful of water, every second hour; at the same time carefully supporting the system with wine whey or small quantities of beef tea. Profound quiet, both of mind and body, is much to be desired throughout the treatment.

Should cerebral disturbance supervene, the application of a blister over the entire scalp will often relieve.

I do not presume to infer that the above is the only proper treatment; but having observed in this colony and British Guiana how very injurious heroic treatment by bleeding, purgatives, and calomel in particular, has proved, induces me to condemn it it as malpractice, and warn young practitioners accordingly. I trust, ere long, that by analyzing the blood during the various stages of yellow fever, an antidote may be discovered for yellow-fever poison. I am inclined to think that some preparation of iron may prove a powerful curative agent.

(signed) *Park B. Tucker*, M.D.

(I.)

EXTRACTS from ANSWERS to Questions No. 2, received from—

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Captain Wainwright, R. N., Superintendent of Her Majesty's Naval Establishments at Bermuda - - - - 80
Henry J. Domville, Esq., R.N., Deputy Inspector General of Hospitals and Fleets - - - - - - 81
Deputy Commissary General Goldie - - - - - - - - - - - - - - 81
Captain Cromartie, R. A. - - - - - - - - - - - - - - - - 81

EXTRACT from Answers of Captain *Wainwright*, R. N., in charge of Naval Establishments at *Bermuda*, to Questions No. 2.

20. An ample supply of water. Drainage to be by means of glazed earthenware pipes, and not soft stone, care being taken that the drains are carried below low-water mark, and means provided for flushing them.

Provision also to be made that barrack refuse be cast into the sea (if taken to sea in boats constructed for the purpose, all the better), and not suffered to accumulate on the shore.

Ventilation.—When there is more than one floor, to have a straight shaft from the lower rooms to the roof, which, in all cases, should be provided with ventilators. To have the ceilings of the verandahs level, the verandahs themselves shaded by jalousies. To take care that the upper sashes of barrack-room windows be made to open.

General.—To keep the men out of the sun as much as possible during the hot hours of the day, and clothed with reference to the existing temperature.

EXTRACTS from Answers of *Henry J. Domville*, Esq., Deputy Inspector General of Hospitals and Fleets, in charge of Naval Hospitals at Bermuda, to Questions, No. 2.

20. I have no opportunities from personal observation of replying to the foregoing questions, but from their tenor I presume that all that had been formerly recommended with a view to diminishing the liability of the troops stationed here to the recurrence of a yellow fever epidemic was fully carried out, and that the attention of the authorities is unremittingly directed to proper ventilation, ample sleeping room, cleanliness, both personal and in and around the barracks, efficient drainage, the daily airing of men's bedding, camping out in summer, a good supply of water, the avoidance of unnecessary exposure, and the encouragement of temperance. I would suggest in furtherance of the latter, both as a moral and sanitary good, that a restriction should be placed on the sale of ardent spirits and that the obstacle now existing to the substitution of malt liquors occasioned by the heavy import duties should be removed.

I am of opinion that a strict quarantine should be enforced during the summer and autumn months, and that on the known existence of the disease in any part of the colony, a system of non-intercourse between the various islands should be established, and although some difficulties may exist to the practical enforcement of such a measure among the community at large, it could be easily enforced in those districts occupied by the naval department and garrison, and could only entail some personal inconvenience in the matter of obtaining supplies for a short period.

EXTRACTS from Answers of Deputy Commissary General *Goldie* to Questions, No. 2.

16. I consider the mode of treatment which I have seen adopted in the West Indian Islands would be certain death in Bermuda, and that there were two fevers here; there seemed to be a type of the yellow fever and the swamp fever of the Southern States. Very little medicine and herb drinks made by the native nurses appears to me to be the best treatment for this place. Keeping up the system and large doses of calomel with ice applications, as in Barbadoes or Nassau, will kill here.

19. I consider that all latrines and urinals, not only in the garrison but in the town, should be lined with cement and cleared by water-power through drains, or by a pump and carts, so that the liquid sewage should not percolate through the porous rock, and thereby effect the water in the wells.

The garrison might be cleansed by erecting a windmill pump and a reservoir; a well could be sunk so as to obtain any amount of salt water, if not of fresh, so that a heavy rush could be obtained to the sea.

It is my opinion that as few white troops as possible should be stationed at St. George's, and that the garrison duty should be done by a West India Regiment, and that where an epidemic does break out, all the men who can be spared should at once be sent to Halifax.

The liability of these islands to the yellow fever will be much diminished by the absence of the seamen who came in the blockade-running steamers, and who were lying about the streets of St. George's drunk during the whole of the summer of 1864, and who I consider to have been the proximate cause of the fever breaking out here, as I have much doubt that either this colony or the Bahamas originate the fever like the West Indian Islands, but that both are sufficiently tropical to hold the infection in the air when it is once imported.

EXTRACT from Answers of Captain *Cromartie*, Royal Artillery, at Ireland Island, to Questions, No. 2.

20. The rooms of the cottages occupied by the married non-commissioned officers and men at Ireland Island are very small and badly ventilated. I would suggest that every two rooms be thrown into one, and windows opened at the back of the cottages, there being none in rear at present, and a verandah erected all round the front of the cottages.

(J.)

RETURN of the Number of Attacks and Deaths from YELLOW FEVER of Her Majesty's Troops, of Sailors and Marines of the Royal Navy, Dockyard Artisans, and Labourers, as well as of the General Civil Population in *Bermuda*, in 1864.

	Her Majesty's Troops, including Officers, Women, and Children.			Sailors, Royal Navy.			Marines, Royal Navy.			Dockyard Artisans and Labourers.						Civil Population.						GRAND TOTAL.			Ratio of Deaths to 1,000 of Strength.
										White.			Coloured.			White.			Coloured.						
	Strength.	Admitted.	Died.	Strength.	Admitted.	Died.	Strength.	Admitted.	Died.	Strength.	Admitted.	Died.	Strength.	Admitted.	Died.	Strength.	Admitted.	Died.	Strength.	Admitted.	Died.	Strength.	Admitted.	Died.	
Staff Corps - - -	108	76	13	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	108	76	13	120·37
Royal Artillery - - -	236	127	33	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	236	127	33	139·83
Royal Engineers - - -	250	115	35	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	250	115	35	140·00
2d Battalion, 2d Regiment -	848	309	120	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	848	309	120	141·50
39th Regiment - - -	3	3	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	3	1	333·33
TOTAL - - -	1,445	630	202	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1,445	630	202	139·79
Unenlisted Men - { Prison warders - Town serjeants - Military labourers }	15	10	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	15	10	4	266·66
TOTAL - - -	1,460	640	206	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1,460	640	206	141·09
Sailors, Royal Navy, Ireland Island.	–	–	–	98	46	15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	98	46	15	153·06
Royal Marines, Ireland Island.	–	–	–	–	–	–	98	12	3	–	–	–	–	–	–	–	–	–	–	–	–	98	12	3	30·61
Dockyard artisans and labourers.	–	–	–	–	–	–	–	–	–	335	146	10	95	16	–	–	–	–	–	–	–	430	162	10	23·25
General civil population -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4,624	1,679	217	6,826	1,469	20	11,450	3,148	237	20·69
GRAND TOTAL - - -	1,460	640	206	98	46	15	98	12	3	335	146	10	95	16	–	4,624	1,679	217	6,826	1,469	20	13,536	4,008	471	34·79

REMARKS.—It will be remarked that not three out of 1,000 of the coloured population died of fever, although the cases were very numerous. Of the white civil population 49 in 1,000 died; while of the troops (including officers, women, and children) 139 in 1,000 died. Non-acclimatisation accounts for this excessive mortality among the troops. The Royal Marines were at an early period removed to Halifax, which accounts for their small loss.

(K.)

RETURN of the Number of Cases and Deaths in the several Parishes, *Bermuda*, during the EPIDEMIC FEVER of 1864–65, not including the Army, Navy, or the Royal Naval Dockyard Establishment.

NAMES OF PARISH.	MALES.						FEMALES.						Bermudians by Birth or Parentage.		Transient Persons.		Sailors.		GENERAL TOTALS.				
	White.			Coloured.			White.			Coloured.													
	Population.	Attacked.	Died.	Population.	Attacked.	Died.	Population.	Attacked.	Died.	Population.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Population.	Attacked.	Ratio, per 1,000, of Cases to Population.	Died.	Ratio, per 1,000, of Deaths to Population.
Sandys - - - -	205	71	3	542	49	–	314	43	2	661	55	–	189	2	29	3	–	3	1,722	218	126·59	5	2·90
Southampton - - -	161	45	1	209	51	–	198	42	1	270	57	–	191	2	4	–	–	–	838	195	232·70	2	2·39
Warwick - - - -	176	33	1	222	34	1	228	21	2	301	32	–	115	3	5	1	–	1	927	120	129·45	4	4·31
Paget - - - -	193	53	5	226	27	–	292	53	1	325	32	–	144	1	21	5	–	–	1,036	165	159·27	6	5·79
Pembroke - - -	496	234	40	537	151	2	688	200	9	785	187	–	626	18	146	33	–	4	2,506	772	308·06	51	20·35
Devonshire - - -	156	82	16	203	47	–	230	38	3	240	39	–	154	7	52	12	–	10	829	206	248·49	19	22·90
Smith - - - -	66	33	3	146	67	1	97	31	2	186	81	–	201	3	11	3	–	–	495	212	428·28	6	12·12
Hamilton - - -	169	118	14	345	194	5	211	104	7	390	182	5	571	24	27	7	–	4	1,115	598	536·32	31	27·80
St. George - - -	336	412	100	521	100	4	408	66	7	717	84	2	258	8	404	105	–	38	1,982	662	334·00	113	57·01
TOTAL - - -	1,958	1,081	183	2,951	720	13	2,666	598	34	3,875	749	7	2,449	68	699	169	–	60	11,450	3,148	274·93	237	20·69

REMARKS.—The population is taken from the census returns of 1861. But there was a large addition, in 1864, to the white population of St. George's parish, and some addition to Pembroke, of sailors and persons engaged in "running the blockade" of American ports. The numbers attacked are believed not to be perfectly reliable, the information was obtained by means of house to house visitation, and probably many cases were returned as being yellow fever which were not so in reality.

(L.)

DAILY RETURN of Admissions and Deaths from YELLOW FEVER, of Non-Commissioned Officers and Men of the Garrison in *Bermuda*, from 19th July to 10th December 1864.

Strength of Troops, &c., in Bermuda on the 23d July 1864.

Officers - - - - - - - -	74	Women - - - - - - - - -	87
Non-Commissioned Officers and Men - - -	1,147	Children - - - - - - - -	141

This Table does not include Officers, Women, or Children.

Sick men were only treated at Fort Cunningham for about a fortnight; at other times they were treated in the Military Hospital, St. George's.

STATION.	Men employed in St. George's, or in the Military Prison, or in the General Hospital, St. George's.										Camp at Fort Cunningham.				Camp Ferry Point.		Camp Walsingham.		Camp at Boaz Island, and in Naval Hospital, Ireland Island, Mount Langton, Gibb's Hill, Prospec Hill.									
CORPS.	39th Regiment.		2d Batt., 2d Regiment.		Royal Artillery.		Royal Engineers.		Staff Corps.		Royal Artillery.		Royal Engineers.		2d Batt., 2d Regiment.		Royal Engineers.		2d Batt., 2d Regiment.		Royal Artillery.		Royal Engineers.		Staff Corps.			
Original Strength at Commencement of Epidemic - -	3		88		48		64		11		67		76		276		9		386		94		22		3			
DATES.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	TOTAL Admitted.	TOTAL Died.
1864:																												
19 July - - -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
20 " - - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
21 " - - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
22 " - - -	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
23 " - - -	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	2	–
24 " - - -	–	–	2	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	4	–
25 " - - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
26 " - - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–
27 " - - -	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
28 " - - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
29 " - - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
30 " - - -	–	–	6	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	7	2
31 " - - -	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
1 August - -	–	–	7	–	–	–	2	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	11	–
2 " - - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
3 " - - -	–	–	–	1	1	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	4	1
4 " - - -	–	–	–	2	1	–	–	–	1	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	4	2
5 " - - -	–	–	2	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	1
6 " - - -	–	–	2	–	1	–	–	–	–	–	–	–	–	–	2	1	–	–	1	–	–	–	–	–	–	–	6	1
7 " - - -	–	–	4	–	3	–	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	9	–
8 " - - -	–	–	–	–	1*	–	–	–	1	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–	3	1*
9 " - - -	–	–	3	–	–	–	1	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	1	–	–	–	7	–
10 " - - -	–	–	6	–	1	–	–	–	–	–	–	–	–	–	1	2	–	–	1	–	–	–	–	–	–	–	9	2
11 " - - -	–	–	1	1	1	2	3	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	6	3
12 " - - -	–	–	3	2	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	5	2
13 " - - -	–	–	1	4	4	–	–	–	–	–	–	–	–	–	2	–	–	–	1	–	–	–	–	–	–	–	8	4
14 " - - -	–	–	3	–	3	–	–	–	1	–	–	–	–	–	4	–	–	–	–	–	–	–	–	–	–	–	11	–

15 August	-	-	1	3	2	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	7	3
16 ,,	-	-	5	4	4	-	1	-	1	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-	-	-	13	5
17 ,,	-	-	4	-	3	1	4	-	-	-	-	-	-	-	1	1	-	-	3	-	-	-	1	-	-	-	16	2
18 ,,	-	-	6	1	-	-	3	2	-	-	-	-	-	-	2	-	-	-	3	1	-	-	-	-	-	-	14	4
19 ,,	-	-	3	2	4	-	1	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	9	4
20 ,,	-	-	7	4	1	1	3	2	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	12	8
21 ,,	-	-	1	-	4	-	7	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	13	-
22 ,,	-	-	1	-	-	-	2	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	5	-
23 ,,	-	-	5	2	1	1	4	1	-	-	-	-	-	-	4	1	-	-	1	-	-	-	-	-	-	-	15	5
24 ,,	-	-	2	2	-	-	-	1	-	-	-	-	-	-	3	1	-	-	8	1	-	-	-	-	-	-	13	5
25 ,,	-	-	10	3	2	-	-	1	1	-	-	-	-	-	-	-	-	-	4	-	2	-	-	-	-	-	19	4
26 ,,	-	-	-	1	1	-	4	-	2	-	-	-	-	-	4	1	-	-	2	-	1	-	-	-	-	-	14	2
27 ,,	-	-	2	2	4	-	6	-	-	-	-	-	-	-	1	1	-	-	1	-	3	-	-	-	-	-	17	3
28 ,,	-	-	-	3	1	-	2	-	-	-	-	-	-	-	1	1	-	-	3	1	1	-	-	-	-	-	8	5
29 ,,	-	-	2	-	-	-	3	3	-	-	-	-	1	-	-	1	-	-	4	1	-	-	-	-	-	-	10	5
30 ,,	1†	-	8	2	1	-	-	-	-	-	-	-	1	-	1	-	-	-	1	1	1	-	-	-	-	-	14	3
31 ,,	-	-	4	-	8	1	4	-	-	-	-	-	1	-	1	1	-	-	3	-	1	-	-	-	-	-	22	2
1 September	-	-	2	1	1	-	2	-	-	-	-	-	3	-	-	-	-	-	-	1	1	-	-	-	-	-	10	2
2 ,,	-	-	1	3	3	1	2	1	-	-	-	-	-	-	1	-	2	-	-	-	1	1	-	-	-	-	9	6
3 ,,	-	-	6	-	-	1	-	3	-	-	1	-	1	-	2	-	1	-	3	2	1	1	-	-	-	-	15	7
4 ,,	-	-	-	4	1	2	1	1	-	-	1	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	5	8
5 ,,	-	-	2	3	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	1	2	-	-	-	-	-	6	4
6 ,,	-	-	3	2	1	1	3	1	-	-	1	-	-	1	1	-	-	-	1	-	-	-	-	-	-	-	10	5
7 ,,	-	-	1	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	7	3
8 ,,	-	-	4	1	1	-	3	1	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	1	-	11	2
9 ,,	-	-	1	-	1	2	-	1	-	-	2	-	-	1	-	-	-	-	-	1	-	1	-	-	-	-	4	6
10 ,,	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	1	-	-	-	-	1	3
11 ,,	-	-	-	1	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
12 ,,	-	-	2	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	6	1
13 ,,	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	5	1
14 ,,	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	2	1
15 ,,	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	-	4	-
16 ,,	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	1
17 ,,	-	-	-	1	1	-	-	-	-	-	-	-	-	-	1	-	1	-	2	-	2	-	-	-	-	-	6	1
18 ,,	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2	1
19 ,,	-	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-	-	1	1	3	-	-	-	1	-	6	3
20 ,,	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	2	-	2	-	-	-	-	-	6	-
21 ,,	-	-	1	-	1	-	2	-	-	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	8	-
22 ,,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-	-	3	-
23 ,,	-	-	-	-	-	-	1	-	-	1	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-	-	4	1
24 ,,	-	-	-	-	-	1	-	1	1	-	-	-	-	-	-	1	-	1	1	-	1	-	-	-	-	-	3	4
25 ,,	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	3	-
26 ,,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	1	-	-	-	-	-	4	3
27 ,,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	2	-
28 ,,	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	1	-	-	-	-	4	1
29 ,,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	2	1	1	-	-	-	-	6	3
30 ,,	-	-	-	-	-	-	-	-	1	1	-	-	-	-	1	-	-	-	3	1	-	-	-	-	-	-	5	2
1 October	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	1	-	-	-	-	2	1
2 ,,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	-	-	-	-	-	-	1	3
3 ,,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	1	-	-	-	-	2	2
4 ,,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5 ,,	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	2	-
6 ,,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-
7 ,,	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	1
8 ,,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
9 ,,	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	1	3
10 ,,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-
11 ,,	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2	1

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* Attacked in military prison.

† In civil prison.

Daily Return of Admissions and Deaths from Yellow Fever, of Non-Commissioned Officers and Men of the Garrison in *Bermuda*, from 19th July to 10th December 1864—*continued*.

DATES.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Total Admitted.	Total Died.
1864:																												
12 October	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13 "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
14 "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-
17 "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-
18 "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
20 "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-
21 "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
22 "	1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	-
4 November	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
19 "	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1
22 "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-
25 "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
4 December	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-
10 "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-
	3	1	131 †	62 †	73 †	20 †	75 †	21 †	11	3	5	-	7	3	61	17	5	1	98	32	33	9	2	1	3	-	507	170
Attack and deaths on passage to or at Halifax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	2	2	-	-	4	3
Total	3	1	131	62	73	20	75	21	11	3	5	-	7	3	61	17	5	1	99	33	34	9	4	3	3	-	511‡	173

* Attacked in civil prison.

† These figures include many men, who were sent to St. George's on fatigue duty, from the camps in the vicinity.

‡ Eleven men were admitted twice into hospital with relapses, the number of men actually treated is, therefore, 500.

T. W. Barrow,
Deputy Inspector General of Hospitals.

(M.)

List of Vessels entered at St. George's.

Date of Arrival.	Name of Vessel.	Tons.	Where from.	
4th June	S. S. Lynx	233	Wilmington	Cotton.
7th „	S. S. Index	363	ditto	ditto.
8th „	Atalanta	253	ditto	ditto.
9th „	S. S. Mary Celestea	207	ditto	ditto.
9th „	S. S. Delta	428	St. Thomas.	
11th „	S. S. City of Petersburg	426	Wilmington	ditto.
13th „	S. S. Fannie	803	Nassau	Ballast, &c.
13th „	Hartley	59	Porto Rico	Sugar.
20th „	S. S. Edith	239	Nassau	Merchandise in transit.
21st „	Ellen	253	ditto	Coals.
27th „	North Heath	343	Wilmington	Cotton.
27th „	S. S. Lilian		ditto	ditto.
28th „	S. S. Florie		ditto	ditto.
4th July	S. S. Mary Celestea	207	ditto	ditto.
4th „	S. S. Lynx	233	ditto	ditto.
6th „	Honeste	136	Nassau	Coal, &c.
6th „	Mary Garland	227	ditto	Merchandise.
6th „	Atalanta	253	Wilmington	Cotton.
6th „	Helen	342	ditto	ditto.
8th „	Alice	803	ditto	ditto.
8th „	Alpha	513	St. Thomas.	
8th „	Edith	239	Wilmington	ditto.
13th „	Lilian	246	ditto	ditto.
13th „	E. D.	110	Nassau	Ballast.
16th „	Isaac Vandyke	35	ditto	Fruit, &c.
23d „	Hayti	876	Jamaica	In transit.
26th „	North Heath	343	Wilmington	Cotton, general cargo.
29th „	Mary Celestea	207	ditto	Cotton.
29th „	Falcon	285	ditto	ditto.
30th „	Wando	650	ditto	ditto.

(N.)

Bermuda.—1864.—No. 15.

An Act further to amend the Act entitled, "An Act to establish certain Regulations for the performance of Quarantine."

Preamble.

Whereas further sanitary precautions and provisions are required for maintaining and preserving the health of these Islands:

We, therefore, your Majesty's most dutiful and loyal subjects, the General Assemby of these your Majesty's Bermuda or Somers' Islands, do most humbly beseech your Majesty that it may be enacted, and be it enacted by your Majesty's Governor, Council and Assembly, and it is hereby enacted as follows:

Boards of Health may fix hours for removing offensive matter, &c.

I. Any Board of Health may from time to time fix the hours within which only it shall be lawful to empty privies or remove offensive matter within the sanitary jurisdiction of the Board of Health, and when any Board of Health shall have fixed such hours and given public notice thereof, every person who within the jurisdiction of the Board empties or begins to empty any privy, or removes along any thoroughfare in the town or parish any offensive matter at any time except within the hours so fixed, and also every person who at any time, whether such hours have been fixed by any Board of Health or not, uses for any such purpose any cart or carriage not having a covering proper for preventing the escape of the contents of such cart or of the stench thereof, or who wilfully slops or spills any such offensive matter in the removal thereof, or who does not carefully sweep and clean every place in which any such offensive matter has been placed, or unavoidably slopped or spilled, shall be liable to a penalty not exceeding forty shillings, and in default of the apprehension of the actual offender, the driver or person having the care of the cart or carriage employed for any such purpose shall be deemed to be the offender; and all penalties imposed under this clause shall be paid to the local Board of Health towards the funds appropriated for sanitary purposes.

Penalties, and appropriation thereof.

Powers of Boards of Health with respect to the removal of nuisances, &c.

II. No person shall suffer any waste or stagnant water to remain in any cellar or other place within any house belonging to or occupied by him in any part of these islands so as to be a nuisance, and every person who so suffers any such water to remain for twelve hours after receiving notice from any Board of Health, inspector of nuisances, churchwarden or parish constable, to remove the same, and every person who allows the contents of any privy or cesspool to overflow or soak therefrom to the annoyance of the occupiers of any adjoining property, shall for every such offence be liable to a penalty not exceeding forty shillings for every day during which such nuisance continues, and any Board of Health may drain and cleanse out any stagnant pools, ditches or ponds of water within the limits of its jurisdiction and abate any such nuisance as aforesaid, and for that purpose may enter by their inspector of nuisances or other officer into and upon any building or land within the said limits at all reasonable times, and do all necessary acts for any of the purposes aforesaid, and the expenses incurred thereby shall be paid by the person committing such offence or occupying the building or land whence such annoyance proceeds, and if their be no occupier, by the owner of such building or land, and shall be recoverable as damages, and all penalties imposed by or under this clause shall be applied in the manner provided for by the next preceding section.

Accumulations of refuse matter, &c., how disposed of.

III. If the dung or soil of any stable, cowhouse or pigstye, or other collection of refuse matter elsewhere than in any farmyard, be at any time allowed to accumulate in any part of these islands for more than thirty days, or for more than seven days after a quantity exceeding one ton has been collected in any place not allowed by any Board of Health, such dung, soil or refuse, if not removed within forty-eight hours after notice from any officer of any Board of Health for that purpose, shall become the property of any Board of Health, and they or any person with whom they have at that time any subsisting contract for the removal of refuse may sell and dispose of the same, and the person who allowed such dung or other matter to accumulate, and who shall have failed to remove the same within such time as aforesaid, shall be liable to a penalty not exceeding 20 *l.* and not less than 10 *l.*, and the money arising under this clause shall be applied towards the sanitary improvement of the town, or parish, and if it should not be required for that purpose shall be paid into the public treasury of these islands.

Penalty, and how to be appropriated.

On certificate of health officers, &c., accumulations of offensive matter may be removed.

IV. If at any time any health officer, or any surgeon or physician, certify under his hand to any Board of Health, that any accumulation of dung, soil or filth, or other noxious or offensive matter within the limits of the jurisdiction of such Board, ought to be removed as being injurious to the health of the inhabitants, the Board of Health shall forthwith give notice to the owner or reputed owner of such dung, soil or filth, or to the occupier of the land where the same are, to remove the same within 24 hours after such notice; and in case of failure to comply with such notice, the said dung, soil or filth, shall thereupon become vested in the Board of Health, and they, or any person with whom they have at that time contracted for the removal of all such refuse, may sell and dispose of the same, and every person refusing or neglecting to comply with the directions of any Board of Health issued under this clause, shall be liable to the same penalty as is provided for by the next preceding section of this Act, and the money arising under this clause shall be applied in the manner mentioned in the third clause of this Act.

Penalty.

Houses, &c., may be cleansed and purified under certificate from health officer, &c.

V. If at any time any health officer or any surgeon or physician certify under his hand to any Board of Health that any house or part of any house or building within the limits of the jurisdiction of such Board, is in such a filthy or unwholesome condition that the health of the inmates or of the neighbours is thereby affected or endangered, or that the whitewashing, cleansing, or purifying of any house or building or any part thereof would tend to prevent or check infectious or contagious disease therein; or that any drain, privy, or cesspool is in such a defective state that the health of the neighbours is thereby affected or endangered, the Board of Health, on the certificate of the health officer, shall, or on the certificate of such surgeon or physican may, order the occupier of such house or part thereof to whitewash, cleanse and purify the same; and the owner of such drain, privy, or cesspool to amend the condition thereof in such manner and within such time as such Board of Health deem reasonable, and if such occupier or owner do not comply with such order he shall be liable to a penalty not exceeding 10*s.* for every day's neglect thereof; and in such case any Board of Health may cause such house or any part thereof to be whitewashed, cleansed, and purified, or the condition of such drain, privy, or cesspool to be amended, and may recover the expense thereof from such occupier or owner in the same manner as damages, and all penalties under this clause shall be applied as provided by the first section of this Act.

Penalty.

Regulations respecting the interment of any corpse.

VI. No coffin containing a corpse shall be buried in any grave in these islands not being a vault or catacomb, without at least 30 inches of soil between the ordinary surface of such burial-ground and the upper side of the coffin; and if the person having the preparation, or the immediate charge of the preparation of the grave to receive such coffin, permit the coffin to be buried in such grave, or if the person having the control of the burial-ground knowingly permit any coffin to be buried in any grave in which there is not left after the burial thereof 30 inches at the least of soil, measuring from the ordinary surface of such burial-ground to the upper side of the coffin, the person having the immediate charge of the preparation of the grave, and the person having the control of the burial-ground in which such burial is made, shall for every such offence be liable to a penalty not exceeding 20 *l.*

Penalty.

VII. Every

Penalty for opening during present year the grave or vault of any person who has died of yellow fever.

VII. Every person who at any time during the present year, after the passing of this Act, shall open, or assist in opening, any grave or vault in these islands, in which any corpse which shall have been interred since the 1st day of June in this present year of any person who shall have died of yellow fever, or any other contagious or infectious disease, shall be liable to a penalty of 100 *l.*, to be recovered, with costs of suit, by any churchwarden or inspector of nuisances, or any Board of Health, and when recovered to be applied as is provided by the 3d section of this Act.

Regulations respecting slaughter-houses, manufactories, &c.

VIII. If any slaughter-house or any building or place for boiling offal or blood, or for boiling or crushing bones, or any pigstye, necessary house, dunghill, manure heap, or any manufactory, building, or place of business within either of the towns of Hamilton or St. George, or in any other thickly populated part of the islands or near thereto, or near to any barrack or other place where troops are stationed, or to any hospital in use as such, or to any vessel or vessels in quarantine or elsewhere, or to any gaol or lunatic asylum, be at any time certified to any Board of Health by any health officer or any surgeon or physician, to be a nuisance, or injurious to the health of the inhabitants or neighbours or other persons, any Board of Health, on the certificate of the health officer, shall, and on the certificate of such surgeon or physician may, direct complaint to be made before two justices, and any justice may summon before any two justices the person by or on whose behalf the work complained of is carried on, and such justices shall inquire into such complaint, and they may, by an order in writing under their hands, order such person to discontinue or remedy the nuisance within such time as to them shall appear expedient: provided always, that if it appears to such justices that in carrying on any business complained of the best means then known to be available for mitigating the nuisance or the injurious effects of such business have not been adopted, they may suspend their final determination upon condition that the person so complained against shall undertake to adopt within a reasonable time such means as the said justices shall judge to be practicable and order to be carried into effect for mitigating or preventing the injurious effects of such business: provided that no slaughter-house, or person concerned in the keeping or management of the same, or in slaughtering or killing any animal shall be liable to be proceeded against under this Act for any offence, in respect of which any action shall have been taken under the provisions of a certain ordinance of the mayor, aldermen, and common council of St. George's, passed by them on the 20th day of August in this present year, relating to slaughter-houses within that town.

Proviso.

Proviso.

Penalty for neglecting to remove nuisances when ordered.

IX. If any such nuisance, or the cause of any such injurious effects as aforesaid, be not discontinued or remedied within such time as shall be ordered by the said justices, the person by or on whose behalf the business causing such nuisance is carried on shall be liable to a penalty not exceeding 5 *l.* for every day during which such nuisance shall be continued or unremedied after the expiration of such time as aforesaid, such penalties to be applied as is provided for by the third section of this Act.

Nothing herein contained shall exempt offenders from being prosecuted according to form of common law.

X. Nothing in this Act contained shall be construed to render lawful any act or omission on the part of any person which is, or but for this Act would be, deemed to be a nuisance at common law, nor to exempt any person guilty of nuisance at common law from prosecution or action in respect thereof, according to the forms of proceeding at common law, nor from the consequences upon being convicted thereof.

Powers of Boards of Health relative to removal of infected vessels.

XI. If at any time any vessel shall be lying in any of the ports, harbours, or anchorages of these islands, and any health officer shall certify to any Board of health that it is expedient for the preservation of the health of the inhabitants of these islands, or any part thereof, that such vessel should be removed to one of the quarantine stations authorised by law, it shall be lawful for such Board of Health to cause such vessel, and the persons on board of her, to be forthwith removed to such quarantine station as such Board of Health shall think fit, and there placed in quarantine; and the expense of such removal may be recovered, with costs, by such Board of Health from any master, owner, part owner or consignee of, or agent for, such vessel, in like manner as penalties are recoverable under this Act; and such vessel, and the persons on board of her, shall be liable, when so placed in quarantine, to such and the like regulations, restrictions, and arrangements as any other vessels or persons in quarantine are or shall be subject to by law.

Lodging-houses to be registered, &c.

XII. It shall not be lawful to keep or use as a public lodging-house any house, unless such house shall have been registered as a lodging-house in a book to be kept by the local Board of Health for that purpose; and every house shall be deemed a public lodging-house within the meaning of this Act in which persons are harboured or lodged for hire for a single night, or for less than one calendar month, at one time, or any part of which is let for any term less than one calendar month; provided that any Board of Health shall be at liberty to grant (without charge) hotel licenses to fit and proper persons, enabling and authorising them to keep hotels; and the Board of Health shall be at liberty to withdraw or cancel any hotel license for any reason which shall appear to it sufficient; but during the time when such person or persons shall hold such hotel license, and the same shall be uncancelled and not withdrawn, the person or persons named therein shall not be liable to the provisions relating to lodging-houses in this Act contained; and the Board of Health shall be at liberty at all times to make and enforce sanitary regulations for the management of places kept as hotels under such licenses.

Proviso.

Regulations respecting lodging-houses.

XIII. The respective Boards of Health shall cause a register to be kept, in which shall be entered the names of all such persons as apply to have the houses occupied by them registered as lodging-houses, and the situations of such houses; and any Board of Health shall from time to time fix the number of lodgers who may be received into each such lodging-house, allowing not less than 400 cubic feet of space to each lodger, and make rules for promoting cleanliness and ventilation in such lodging-house, and they shall order that a ticket containing the number of lodgers allowed to be received into the house, and a table of rules for promoting cleanliness and ventilation shall be hung up or placed in a conspicuous part of each room into which lodgers are received; and the keepers of all such lodging-houses shall at all times observe the said rules, and give access to such lodging-houses when required by any persons appointed by any Board of Health for the purpose of inspection thereof, or for the purpose of performing therein any disinfecting process which any Board of Health may order.

Penalty for neglecting rules relating to lodging-houses.

XIV. Every person who shall keep any lodging-house, and receive lodgers therein, without such lodging-house having been duly registered, or who shall receive into the same more lodgers than shall be allowed by any Board of Health, or who shall fail to keep such ticket or such table of rules as aforesaid hung up or displayed, as required by any Board of Health, or who shall neglect to cause such rules to be observed in any such lodging-house, or who shall refuse or impede access at all reasonable times to any person appointed by any Board of Health for any of the purposes aforesaid, or who shall wilfully obstruct any such person in performing any disinfecting process therein which any Board of Health may order, shall be liable to a penalty not exceeding 40*s.* for each such offence, to be applied as provided for by the first section of this Act.

Boards of Health may make bye-laws for regulating slaughter-houses, &c.

Proviso.

XV. Any Board of Health may from time to time, by bye-laws to be confirmed in the manner hereinafter provided, make regulations for the licensing, registering, and inspection of all slaughter-houses and knackers' yards, and preventing cruelty therein, and for keeping the same in a cleanly and proper state, and for removing filth at least once in every 24 hours, and requiring them to be provided with a sufficient supply of water, and they may impose pecuniary penalties on persons breaking such bye-laws; provided that no such penalty exceed for any one offence the sum of 20 *l.*, and in the case of a continuing nuisance, the sum of 20*s.* for every day during which such nuisance shall be continued after the conviction of the first offence; and all penalties incurred for the breach of any such regulations shall be applied as is provided for by the third section of this Act.

Bye-laws respecting maintenance of health in towns, &c.

Proviso.

Proviso.

Proviso.

XVI. Any Board of health in these islands may lawfully make any bye-laws for maintaining, guarding, or preserving the health of the town or parish over which such Board of Health has sanitary jurisdiction; and such bye-laws, on being sanctioned by the Governor and Council shall go into operation and have the force of law; provided that no such bye-law shall impose any penalty exceeding 20 *l.*, and for continuing offences 20 *s.* a day, or imprisonment in default of payment exceeding three calendar months; provided also, that the penalties imposed by any such bye-law may not in any case be sued for before any justice of the peace being a member of the Board of Health which made the bye-law alleged to have been violated; provided also that no such bye-law be repugnant to any Act of the Legislature of these islands.

Governor in Council may issue proclamation respecting use of burial grounds, &c.

XVII. On the representation of the local Board of Health, or on the appearance of any sickness in these islands, supposed or reputed to be contagious or infectious, or for other cause which shall appear to the Governor in Council sufficient, it shall be lawful for the Governor in Council, after giving notice to the bishop of the diocese within which these islands shall for the time being be included by Her Majesty's letters patent, or in his absence to the ecclesiastical commissary or other officer of the bishop, or in the absence of such officer, to the rector and churchwardens, or in case of burial grounds used with places of worship of other denominations than the Church of England, to the minister or incumbent or any other officer of such place of worship, or to the congregation usually worshipping therein, to proclaim that any burial ground or place used for burials in these islands cannot be used without danger to the health of persons living in the neighbourhood, or passing along the public roads, or frequenting any such church or chapel or place of worship; and in such case it shall not be lawful, after a time to be named in such proclamation, to bury, or permit or suffer to be buried, any further corpses or coffins in, within, or under the ground, church, or place of worship to which the proclamation relates, except in so far as may be allowed in such proclamation; and whosoever, after the publication of such proclamation, buries, or causes or permits or suffers to be buried, any corpse or coffin, contrary to this enactment, shall, for every such offence, be liable to a penalty of 20 *l.*

Penalty for burying any corpse elsewhere than in an authorised place.

XVIII. After the passing of this Act, every person who shall bury or cause to be buried, or be instrumental in, or party to the burial of any corpse in any place other than a burial ground attached or belonging to some parish church, or to some other place of worship, and in use as a burial ground at the time of passing this Act, or than in some cemetery lawfully set apart and inclosed as such at the time of passing this Act, or than in such place as may hereafter be authorised to be used as a burial ground by the Board of Health of the parish or town where the same is situated, or by the Governor and Council, and every person who shall throw or cast, or who shall be instrumental in or party to the throwing or casting of, any corpse into the water of any harbour, bay, or inlet of these islands, or within one mile from the shore thereof, shall be liable to a penalty of 20 *l.*

XIX. The 15th section of the Act hereby amended is repealed, except as to offences committed before the passing of this Act, in respect of which the provisions of the said section may be enforced as if this Act had not been passed, and it is hereby enacted that after the passing of this Act, every person who shall throw or cast, or shall be concerned in, or a party to the throwing or casting of, the carcase of any animal into the water, or who shall deposit or place or be a party to the depositing or placing of any such carcase on the shores or beach of any harbour, bay, or inlet, or in any water within these islands, or within one mile from any part of the outer shores of these islands, and every person in these islands who being either the actual owner or the person in charge of the dead body of any animal which shall be found dead, shall neglect for the space of six hours after notice of such death to have the same effectually buried in such manner as to prevent any offensive or infectious scent therefrom, shall be liable to a penalty of not less than 10 *l.*, and not more than 20 *l.* for every offence; and it shall be lawful for any Justice of the Peace or churchwarden or inspector of nuisances to cause such carcase to be effectually buried, and in addition to the penalty hereinbefore imposed, the person who was the owner or the person who was in charge of such animal at the time of its death shall be liable to pay the full expenses attending the removal and burial of such dead body, and in default of payment the same may be sued for and recovered with costs before any Justice of the Peace in these islands.

The 15th Section of Act hereby amended, repealed —with certain exceptions—and other regulations made.

Penalty.

XX. Every Board of Health in these islands shall have power to appoint during pleasure any parish constable or other person to be inspector of nuisances in the town or parish, and such inspector of nuisances shall have such powers as the bye-laws of the Board of Health made and confirmed in the manner hereinbefore provided for shall give him, and the Board of Health shall have power to remove any inspector of nuisances for any cause; and every such inspector shall receive such remuneration for his services as the Board of Health out of the funds at its disposal for sanitary purposes shall think fit.

Boards of Health may appoint inspectors of nuisances, &c.

XXI. Every Board of Health in these islands shall have power to raise by assessment, in the usual manner, a rate or fund for sanitary purposes; provided that no parochial Board of Health shall assess to such rate any property within any town corporation limits; and every parochial Board of Health or vestry shall assess under this clause in like manner and at the same time, and shall collect the rates imposed under this clause in the same manner and with like remedies on default of payment as are applicable to the collection of other parish rates; and every Board of Health of any town or corporation shall assess under this clause in like manner and at the same time, and shall collect the rates imposed under this clause in the same manner and with like remedies on default of payment as are applicable to the collection of police rates; provided that no assessment under this clause shall, during any one year exceed one shilling in the 100 *l.* on the property assessed. Provided also, that any rate made under this clause may either be made prospectively to raise money for the payment of future charges and expenses, or retrospectively to raise money for the payment of charges and expenses incurred at any time within twelve months before the making of the rate; provided also, that it shall be lawful for any Board of Health to reduce or remit the payment of any rate on account of the poverty of any person liable to the payment thereof; provided, that at any time after the passing of this Act every Board of Health shall have power whenever occasion shall arise therefor to raise a special rate for sanitary purposes not exceeding sixpence in the 100 *l.*, by assessment of the property hereby made liable for assessment for such purposes whether the same shall or shall not have been assessed therefor at the usual time of assessment then last past, with the like power of reduction and remission on account of poverty hereinbefore given.

Boards of Health may raise by assessment a rate for sanitary purposes.

Proviso.

Proviso.

Proviso.

Proviso.

XXII. All penalties and fines, and other pecuniary liabilities provided for by or under the authority of this Act, shall and may be sued for and recovered, with costs of prosecution, before any two justices of the peace (neither of whom shall be a member of the local Board of Health); and if the fine, penalty, or damages and costs be not paid within such time as the justices shall order, the convicting justices may either commit the offender to gaol, there to be kept, with or without hard labour, for such term not exceeding, in cases not otherwise provided for by this Act, six calendar months, as such justices shall adjudge, unless the money adjudged to be paid be sooner paid; or the said justices may issue a warrant for the distress and sale, in the usual manner, of the offender's goods; and if, on return of the warrant, it shall appear to the justices that a sufficient distress cannot be made, such justices may in such case commit the offender to gaol, with or without hard labour, for such term as aforesaid.

Penalties, how sued for and recovered.

XXIII. This Act shall continue in force during the continuance of the Act hereby amended.

Duration of Act.

Passed the Assembly this 24th day of August 1864.

By order of the House,

(signed) *George Somers Tucker,* Speaker.

Concurred in by the Legislative Council, this 25th day of August 1864.

(signed) *John Harvey Darrell,* President.

Assented to this 25th day of August 1864.

(signed) *W. G. Hamley,*

Lieutenant Governor and Commander in Chief.

(Q.)

TABULAR RETURNS of Statistics of Yellow Fever Epidemic of 1864 in Her Majesty's Military and Naval Establishments at *Bermuda*.

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(F.)	Royal Engineers, Daily Return - - - - - -	95
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(H.)	Royal Artillery, Daily Return - - - -	97
(I.)	Barrack Department Return - - - -	98
(J.)	Military Store Department Return - - -	99
(K.)	Naval Establishment Return - - - -	100
(L.)	Her Majesty's Ships - - - - -	100

Bermuda.—Epidemic of 1864–5.

(A.)—GENERAL RETURN of Statistics of Yellow Fever among Her Majesty's Troops in *Bermuda*.

Barrack or Encampment (if possible) where Attacked.	OCCUPATION on 23d July 1864.				ATTACKS.				DEATHS.				REMARKS.
	Officers.	Men.	Women and Children.	Others.	Officers.	Men.	Women and Children.	Others.	Officers.	Men.	Women and Children.	Others.	
St. George's - - - - - - -	42	214	124	–	26	293	64	–	11	107	10	–	* 18 men were admitted twice in hospital with relapses; the number of men actually treated is therefore 493.
Fort Cunningham - - - - - - -	5	143	–	–	4	12	–	–	2	3	–	–	
Ferry Point - - - - - - - -	6	276	25	–	1	61	–	–	1	17	–	–	
Walsingham - - - - - - - -	–	9	–	–	–	5	–	–	–	1	–	–	
Boaz and Ireland Island - - - - -	19	487	74	–	7	131	13	–	–	45	4	–	
Prospect Hill and Mount Langton - - -	1	13	5	–	1	6	2	–	–	–	1	–	
Gibbs Hill - - - - - - - -	–	5	–	–	–	3	–	–	–	–	–	–	
The Flats - - - - - - - -	1	–	–	–	1	–	–	–	–	–	–	–	
Total - - -	74	1,147	228	–	40	511*	79	–	14	173	15	–	

(B.)—GENERAL RETURN of Statistics of Yellow Fever in the 2d Battalion of 2d (Queen's) Royal Regiment.

DATE.	Barrack or Encampment (if possible) where Attacked.	OCCUPATION.					ATTACKS.					DEATHS.					REMARKS.
		Officers.	Officers' Wives and Children.	Men.	Men's Wives and Children.	Others.	Officers.	Officers' Wives and Children.	Men.	Men's Wives and Children.	Others.	Officers.	Officers' Wives and Children.	Men.	Men's Wives and Children.	Others.	
From 16 July to 31 Dec. 1864.	Royal Barracks -	3	2	40	2	–	5	3	130	5	–	2	–	62	3	–	
	Ferry Point Camp	7	2	324	29	–	1	–	60	3	–	1	–	17	–	–	
	Boaz Island - -	4	4	377	34	–	2	2	92	2	–	–	1	29	1	–	
	Mount Langton -	–	–	11	–	–	–	–	5	–	–	–	–	2	–	–	
	Gibbs Hill - -	–	–	4	–	–	–	–	2	–	–	–	–	1	–	–	

Jas. Rose, Lieut.-Colonel,
Commanding 2d Battalion 2d Regiment.

O

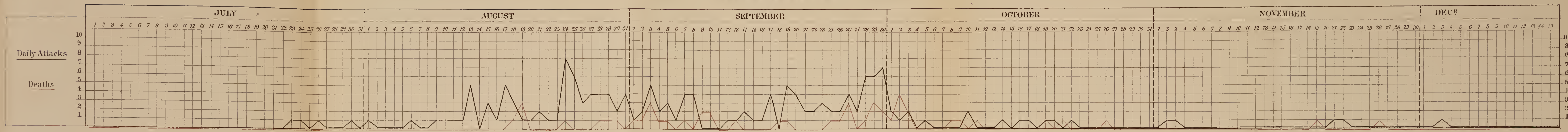
DIAGRAM

Showing the daily Progress of the Epidemic of

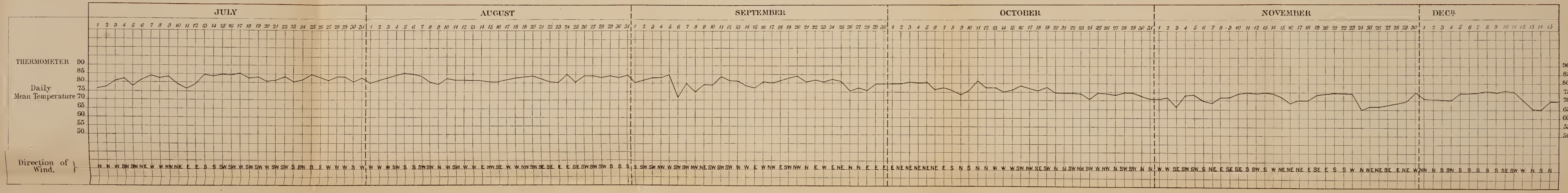
YELLOW FEVER AT BERMUDA IN 1864,

Amongst Her Majesty's Troops:
From 1st July to the 15th December (inclusive)
as also the Daily Mean of the
THERMOMETER & PREVAILING WINDS,
during the same period.

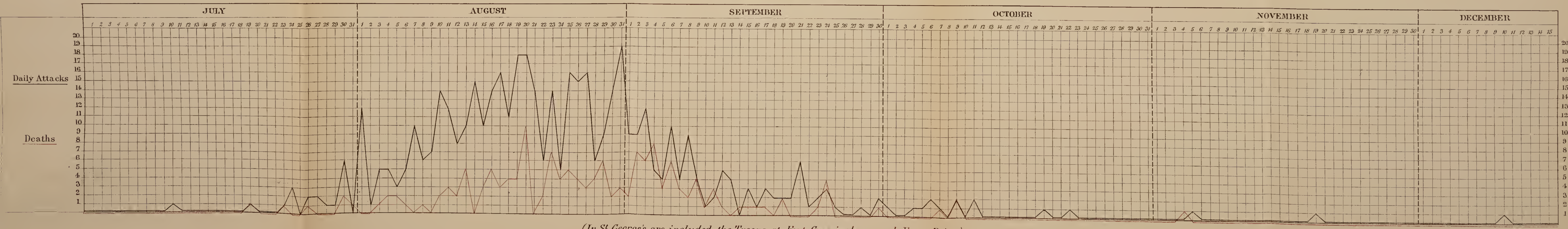
IRELAND ISD



(In Ireland Island are included the Troops at Boaz Isd and at the Signal Stations of Mount Langton and Gibbs Hill)



ST GEORGE'S ISD

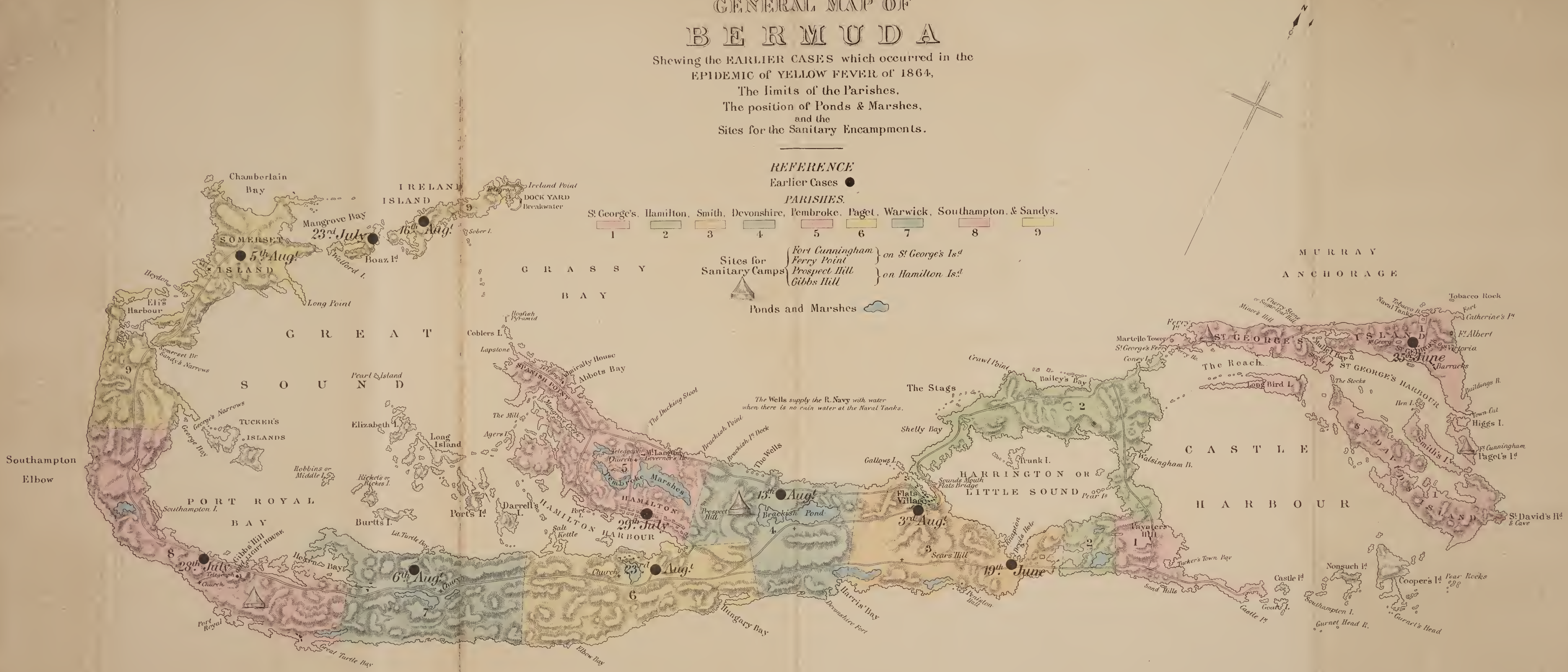


(In St George's are included the Troops at Fort Cunningham and Ferry Point)
(Officers, Women and children are included in the above numbers)

P

GENERAL MAP OF BERMUDA

Shewing the EARLIER CASES which occurred in the
EPIDEMIC of YELLOW FEVER of 1864,
The limits of the Parishes,
The position of Ponds & Marshes,
and the
Sites for the Sanitary Encampments.



REFERENCE

Earlier Cases ●

PARISHES.

St. George's,	Hamilton,	Smith,	Devonshire,	Pembroke,	Paget,	Warwick,	Southampton,	& Sandys.
1	2	3	4	5	6	7	8	9

Sites for Sanitary Camps { *Fort Cunningham*, *Ferry Point* } *on St. George's Isd.*; { *Prospect Hill*, *Gibbs Hill* } *on Hamilton Isd.*

Ponds and Marshes

Edwd Weller, Litho. Red Lion Square

(C.)—DAILY RETURN of YELLOW FEVER STATISTICS in the 2d Battalion of 2d QUEEN'S ROYAL REGIMENT at *St. George's* and *Ferry Point.*

DATE.	STRENGTH.						ATTACKS.						DEATHS.						REMARKS.
	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	
1864:																			
23 July	–	–	12	364	13	4	–	–	–	1	–	–	–	–	–	–	–	–	
24 „	–	–	12	364	13	4	–	–	–	2	–	–	–	–	–	–	–	–	
27 „	–	–	12	364	13	4	–	–	–	1	–	–	–	–	–	–	–	–	
30 „	–	–	12	364	13	4	–	–	–	6	–	–	–	–	–	2	–	–	
1 August	–	–	12	362	8	4	–	–	–	8	–	–	–	–	–	–	–	–	
3 „	–	–	12	362	8	4	–	–	–	3	–	–	–	–	–	1	–	–	
4 „	–	–	12	361	8	4	–	–	–	2	–	–	–	–	–	2	–	–	
5 „	–	–	12	359	8	4	–	–	–	2	–	–	–	–	–	1	–	–	
6 „	–	–	12	358	8	4	–	–	–	4	–	–	–	–	–	1	–	–	
7 „	–	–	12	357	8	4	–	–	–	5	–	–	–	–	–	–	–	–	
8 „	–	–	12	357	8	4	–	–	–	1	–	–	–	–	–	1	–	–	
9 „	–	–	12	356	8	4	–	–	–	5	–	–	–	–	–	–	–	–	
10 „	–	–	12	356	8	4	–	–	–	7	–	–	–	–	–	2	–	–	
11 „	–	–	12	354	8	4	–	–	–	2	–	1	–	–	–	1	–	–	
12 „	–	–	12	353	8	4	–	–	–	4	–	–	–	–	–	2	–	–	
13 „	–	–	12	351	8	3	–	–	3	3	–	–	–	–	–	4	–	1	
14 „	–	–	12	347	8	3	–	–	–	7	–	–	–	–	–	–	–	–	
15 „	–	–	12	347	8	3	–	–	–	1	–	1	–	–	–	3	–	–	
16 „	–	–	12	343	8	3	–	–	–	6	–	–	–	–	–	5	–	–	
17 „	–	–	12	338	8	3	–	–	–	5	–	–	–	–	–	1	–	–	
18 „	–	–	12	337	8	3	–	–	1	8	–	–	–	–	–	1	–	1	
19 „	–	–	12	336	8	2	–	–	–	3	–	1	–	–	1	2	–	–	
20 „	–	–	11	334	8	2	–	–	–	8	–	–	–	–	1	5	–	–	
21 „	–	–	10	329	8	2	–	–	–	2	–	–	–	–	–	–	–	–	
22 „	–	–	10	329	8	1	–	–	–	2	–	–	–	–	–	–	–	1	
23 „	–	–	10	329	8	1	–	–	–	9	–	–	–	–	–	3	–	–	
24 „	–	–	10	326	8	1	–	–	–	5	–	–	–	–	–	3	–	–	
25 „	–	–	10	323	8	1	–	–	1	10	–	–	–	–	–	3	–	–	
26 „	–	–	10	320	8	1	–	–	–	4	1	1	–	–	–	2	–	–	
27 „	–	–	10	318	8	1	–	–	1	3	–	–	–	–	–	3	–	–	
28 „	–	–	10	315	8	1	–	–	–	1	–	–	–	–	–	4	–	–	
29 „	–	–	10	311	8	1	–	–	–	2	–	–	–	–	–	1	–	–	
30 „	–	–	10	310	8	1	–	–	1	9	–	–	–	–	–	2	–	–	
31 „	–	–	10	308	8	1	–	–	–	5	–	–	–	–	1	1	–	–	
1 September	–	–	9	307	8	1	–	–	–	2	–	–	–	–	–	1	–	–	
2 „	–	–	9	306	8	1	–	–	–	2	–	–	–	–	–	3	–	–	
3 „	–	–	9	303	8	1	–	–	–	8	–	–	–	–	–	–	–	–	
4 „	–	–	9	303	8	1	–	–	–	–	–	–	–	–	–	4	–	–	
5 „	–	–	9	299	8	1	–	–	–	2	–	–	–	–	–	3	–	–	
6 „	–	–	9	296	8	1	–	–	–	4	–	–	–	–	–	2	–	–	
7 „	–	–	9	294	8	1	–	–	–	1	–	–	–	–	–	2	–	–	
8 „	–	–	9	292	8	1	–	–	–	4	–	–	–	–	–	1	–	–	
9 „	–	–	9	291	9	4	–	–	–	1	–	–	–	–	–	–	–	–	1 woman and 3 children from Boaz.
10 „	–	–	9	291	9	4	–	–	–	1	–	–	–	–	–	–	–	–	
11 „	–	–	9	291	9	4	–	–	–	–	–	–	–	–	–	1	–	–	
12 „	–	–	9	290	9	4	–	–	–	2	–	–	–	–	–	–	–	–	
13 „	–	–	9	290	9	4	–	–	–	2	–	–	–	–	–	–	–	–	
14 „	–	–	9	290	9	4	–	–	–	–	–	–	–	–	–	1	–	–	
15 „	–	–	9	290	10	8	–	–	–	2	–	–	–	–	–	–	–	–	1 woman and 4 children from Boaz; 1 officer to Boaz.
17 „	–	–	8	290	10	8	–	–	–	1	–	–	–	–	–	1	–	–	30 men to Boaz.
19 „	–	–	8	259	10	8	–	–	–	1	–	–	–	–	–	–	–	–	
21 „	–	–	8	259	10	8	–	–	–	3	–	–	–	–	–	–	–	–	
22 „	–	–	8	259	10	8	–	–	–	1	–	–	–	–	–	–	–	–	
23 „	–	–	7	259	10	8	–	–	–	1	–	–	–	–	–	–	–	–	
24 „	–	–	7	258	10	8	–	–	–	–	–	–	–	–	–	1	–	–	1 officer proceeded on leave of absence.
28 „	–	–	7	258	10	8	–	–	–	1	–	–	–	–	–	–	–	–	
30 „	–	–	7	258	10	8	–	–	–	1	–	–	–	–	–	–	–	–	7 men from Boaz.
1 October	–	–	7	257	10	8	–	–	–	1	–	–	–	–	–	–	–	–	
5 „	–	–	7	265	10	8	–	–	–	1	–	–	–	–	–	–	–	–	
6 „	–	–	7	265	10	8	–	–	–	2	–	–	–	–	–	–	–	–	
7 „	–	–	7	265	10	8	–	–	–	1	–	–	–	–	–	1	–	–	
9 „	–	–	7	264	10	8	–	–	–	–	–	–	–	–	–	2	–	–	
10 „	–	–	7	322	10	8	–	–	–	1	–	–	–	–	–	–	–	–	

During the month of November the greater part of No. 3 Company and men attacked were removed from Boaz Island to Ferry Point.

Jas. Rose, Lieutenant Colonel,
Commanding 2d Battalion 2d Regiment.

(D.)—DAILY RETURN of YELLOW FEVER STATISTICS in the 2d Battalion of 2d QUEEN'S ROYAL REGIMENT at *Boaz Island, Ireland Island, Gibb's Hill,* and *Mount Langton.*

DATE.	STRENGTH.						ATTACKS.						DEATHS.						REMARKS.
	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	
1864:																			
23 July - -	–	–	12	386	17	38	–	–	–	1	–	–	–	–	–	–	–	–	
24 „ - -	–	–	12	386	17	38	–	–	–	1	–	–	–	–	–	–	–	–	
26 „ - -	–	–	12	386	17	38	–	–	–	1	–	–	–	–	–	–	–	–	
30 „ - -	–	–	12	386	17	38	–	–	–	1	–	–	–	–	–	–	–	–	
1 August - -	–	–	12	386	22	38	–	–	–	1	–	–	–	–	–	–	–	–	
6 „ - -	–	–	12	386	22	38	–	–	–	1	–	–	–	–	–	–	–	–	
10 „ - -	–	–	12	386	22	38	–	–	–	1	–	–	–	–	–	–	–	–	
12 „ - -	–	–	12	386	22	38	–	–	–	1	–	–	–	–	–	–	–	–	
13 „ - -	–	–	12	386	22	38	–	–	–	1	–	–	–	–	–	–	–	–	
15 „ - -	–	–	12	386	22	38	–	–	–	2	–	–	–	–	–	–	–	–	
16 „ - -	–	–	12	386	22	38	–	–	–	1	–	–	–	–	–	–	–	–	
17 „ - -	–	–	12	386	22	38	–	–	–	3	–	–	–	–	–	–	–	–	
18 „ - -	–	–	12	386	22	38	–	–	–	3	–	–	–	–	–	1	–	–	
19 „ - -	–	–	12	385	22	38	–	–	–	1	–	–	–	–	–	–	–	–	
22 „ - -	–	–	12	385	22	38	–	–	–	1	–	–	–	–	–	–	–	–	
23 „ - -	–	–	12	385	22	38	–	–	–	1	–	–	–	–	–	–	–	–	
24 „ - -	–	–	12	385	22	38	–	–	–	8	–	–	–	–	–	1	–	–	
25 „ - -	–	–	12	384	22	38	–	–	–	4	–	–	–	–	–	–	–	–	
26 „ - -	–	–	12	384	22	38	–	–	–	2	–	–	–	–	–	–	–	–	
27 „ - -	–	–	12	384	22	38	–	–	1	1	–	–	–	–	–	–	–	–	
28 „ - -	–	–	12	384	22	38	–	–	–	3	–	–	–	–	–	1	–	–	
29 „ - -	–	–	12	383	22	38	–	–	–	4	–	–	–	–	–	1	–	–	
30 „ - -	–	–	12	382	22	38	–	–	–	1	–	–	–	–	–	1	–	–	
31 „ - -	–	–	12	381	22	38	–	–	–	3	–	–	–	–	–	–	–	–	
1 September -	–	–	12	381	22	38	–	–	–	3	1	1	–	–	–	1	–	–	
3 „ - -	–	–	12	380	22	38	–	–	–	–	–	–	–	–	–	2	–	–	
4 „ - -	–	–	12	378	22	38	–	–	–	1	–	–	–	–	–	1	–	–	
5 „ - -	–	–	12	377	22	38	–	–	–	1	–	–	–	–	–	1	–	–	
6 „ - -	–	–	12	376	22	38	–	–	–	4	–	–	–	–	–	–	–	–	
7 „ - -	–	–	12	376	22	38	–	–	–	1	–	–	–	–	–	–	1	–	
8 „ - -	–	–	12	376	22	38	–	–	–	–	–	–	–	–	–	–	–	–	
9 „ - -	–	–	12	376	22	38	–	–	–	–	–	–	–	–	–	1	–	–	1 woman and 3 children to Ferry Point.
10 „ - -	–	–	4	174	21	35	–	–	–	2	–	–	–	–	–	1	–	–	8 officers and 202 men to Halifax.
14 „ - -	–	–	4	174	21	35	–	–	–	1	–	–	–	–	–	–	–	–	
15 „ - -	–	.	4	173	21	35	–	–	–	1	–	–	–	–	–	–	–	–	1 woman and 3 children to Ferry Point.
16 „ - -	–	–	5	173	20	32	–	–	–	2	–	–	–	–	–	–	–	–	1 officer from Ferry Point.
17 „ - -	–	–	5	173	20	32	–	–	–	1	–	–	–	–	–	–	–	–	30 men from Ferry Point.
18 „ - -	–	–	5	203	20	32	–	–	–	1	–	–	–	–	–	–	–	–	
19 „ - -	–	–	5	203	20	32	–	–	–	2	–	–	–	–	–	1	–	–	
20 „ - -	–	–	5	202	20	32	–	–	–	2	–	–	–	–	–	–	–	–	
22 „ - -	–	–	5	202	20	32	–	–	–	2	–	–	–	–	–	–	–	–	
23 „ - -	–	–	5	202	20	32	–	–	–	1	–	–	–	–	–	–	–	–	
24 „ - -	–	–	5	202	20	32	–	–	–	2	–	–	–	–	–	–	–	–	1 officer, 51 men, and 2 women to Halifax.
25 „ - -	–	–	4	151	18	32	–	–	–	3	–	–	–	–	–	–	–	–	
26 „ - -	–	–	4	151	18	32	–	–	1	1	–	–	–	–	–	3	–	–	
27 „ - -	–	–	4	151	18	32	–	–	–	4	–	–	–	–	–	–	–	–	
28 „ - -	–	–	4	151	18	32	–	–	–	4	1	–	–	–	–	–	–	–	1 man attacked on passage to Halifax.
29 „ - -	–	–	4	151	18	32	–	–	7	5	–	–	–	–	–	2	–	–	
30 „ - -	–	–	4	151	18	32	–	–	–	3	–	1	–	–	–	2	–	–	1 man died at Halifax.
2 October -	–	–	4	150	18	32	–	–	–	1	–	–	–	–	–	3	–	–	
3 „ - -	–	–	4	147	18	32	–	–	–	2	–	–	–	–	–	1	–	–	
5 „ - -	–	–	4	146	18	32	–	–	–	1	–	–	–	–	–	–	–	–	
8 „ - -	–	–	4	146	18	32	–	–	–	–	–	–	–	–	–	1	–	–	
9 „ - -	–	–	4	145	18	32	–	–	–	–	–	–	–	–	–	1	–	–	
10 „ - -	–	–	4	144	18	32	–	–	–	1	–	–	–	–	–	–	–	–	
11 „ - -	–	–	4	144	18	32	–	–	–	–	–	–	–	–	–	1	–	–	
13 „ - -	–	–	4	143	18	32	–	–	–	–	–	–	–	–	–	1	–	–	
16 „ - -	–	–	4	142	18	32	–	–	–	1	–	–	–	–	–	–	–	–	
17 „ - -	–	–	4	142	18	32	–	–	–	1	–	–	–	–	–	–	–	–	
19 „ - -	–	–	4	142	18	32	–	–	–	–	–	–	–	–	–	1	–	–	
20 „ - -	–	–	4	141	18	32	–	–	–	1	–	–	–	–	–	–	–	–	
21 „ - -	–	–	4	141	18	32	–	–	–	–	–	–	–	–	–	1	–	–	
19 November -	–	–	3	140	18	32	–	–	–	–	–	–	–	–	–	1	–	–	1 officer proceeded on leave of absence.
22 „ - -	–	–	3	139	18	32	–	–	–	1	–	–	–	–	–	–	–	–	
25 „ - -	–	–	3	139	18	32	–	–	–	–	–	–	–	–	–	1	–	–	During the month of November the greater part of No. 3 Company, and men attacked, proceeded to headquarters.
4 December -	–	–	3	90	18	32	–	–	–	1	–	–	–	–	–	–	–	–	

James Rose, Lieutenant Colonel,
2d Battalion 2d Regiment.

(E.)—GENERAL RETURN of Statistics of Yellow Fever in the Royal Engineers.

DATE.	Barrack or Encampment (if possible) where Attacked.	OCCUPATION.					ATTACKS.					DEATHS.					REMARKS.
		Officers.	Officers' Wives and Children.	Men.	Men's Wives and Children.	Others.	Officers.	Officers' Wives and Children.	Men.	Men's Wives and Children.	Others.	Officers.	Officer's Wives and Children.	Men.	Men's Wives and Children.	Others.	
1864:																	
1 Aug. -	St. George's Camp - -	1	–	127	6	–	–	–	4	–	–	–	–	–	–	–	The strength is only given for the first day of the period; the attacks from 1st to 14th August.
	Ditto - Quarters - -	4	–	12	28	–	–	–	2	7	–	–	–	–	–	–	
	Walsingham Camp - -	–	–	9	–	–	–	–	–	–	–	–	–	–	–	–	
	Ireland and Boaz Island Quarters.	–	–	14	30	–	–	–	1	–	–	–	–	–	–	–	
	D. M. Prison - - -	–	–	6	–	–	–	–	1	–	–	–	–	–	–	–	
	Royal Artillery Hospital -	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	
	Mount Langton - - -	1	6	–	–	–	–	–	–	–	–	–	–	–	–	–	
		6	6	171	64	–	–	–	8	7	–	–	–	–	–	–	
15 Aug. -	St. George's Camp and Hospital	1	–	50	6	–	–	–	15	3	–	–	–	2	–	–	The strength is only given for the first day of the period, 15th August; the attacks and deaths occurred between 15th and 31st August 1865.
	Ditto - Quarters - -	4	–	12	28	–	2	–	6	6	–	2	–	2	2	–	
	Fort Cunningham Camp -	–	–	72	–	–	–	–	28	–	–	–	–	7	–	–	
	Ireland and Boaz Island -	–	–	22	30	–	–	–	1	-	–	–	–	1	–	–	
	Walsingham Camp - -	–	–	9	–	–	–	–	–	–	–	–	–	–	–	–	
	D. M. Prison - - -	–	–	6	–	–	–	–	–	–	–	–	–	–	–	–	
	Mount Langton - - -	1	4	–	–	–	–	–	–	–	–	–	–	–	–	–	
		6	4	171	64	–	2	–	50	9	–	2	–	12	2	–	
1 Sept. -	St. George's Camp and Hospital	–	–	41	6	–	–	–	10	–	–	–	–	5	–	–	The strength is only given for the 1st September; the attacks and deaths occurred between 1st and 30th September 1864.
	Ditto - Quarters - -	–	–	6	26	–	–	–	3	8	–	–	–	–	–	–	
	Fort Cunningham Camp -	3	–	82	–	–	–	–	14	–	–	–	–	8	–	–	
	Ireland and Boaz Island -	–	–	21	30	–	–	–	–	–	–	–	–	–	–	–	
	Walsingham Camp - -	–	–	9	–	–	–	–	5	–	–	–	–	1	–	–	
	Mount Langton - - -	1	4	–	–	–	–	–	–	–	–	–	–	–	–	–	
		4	4	159	62	–	–	–	32	8	–	–	–	14	–	-	

(F.)—DAILY RETURN of Yellow Fever Statistics in the Royal Engineers.

Royal Engineers at *Boaz Island, Ireland Island, Prospect Hill,* and *Mount Langton.*

DATE.	STRENGTH.						ATTACKS.						DEATHS.						REMARKS.
	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	
1864:																			
9 August 11 „ -	–	–	–	15	10	20	–	–	–	1	–	13 Aug. 1	–	–	–	–	–	–	Onion's child.
17 „ -	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	19 Aug. 1	
19 „ -	–	–	–	15	10	19	–	–	–	–	–	–	–	–	–	1	–	–	
26 October	–	–	–	14	10	19	–	–	–	–	19 Oct. 1	–	–	–	–	–	26 Oct. 1	-	Mrs. Lowe.
21 Nov. -	–	–	–	14	9	19	–	–	1	–	–	–	–	–	–	–	–	–	Colonel Hanley, Mount Langton.
Sept. -	–	–	–	14	9	19	–	–	–	–	–	23 Sept. 1	–	–	–	–	–	25 Sept. 1	

W. G. Hamley,
Colonel, Commanding Royal Engineers.

DAILY RETURN of YELLOW FEVER STATISTICS in the ROYAL ENGINEERS—*continued.*

ROYAL ENGINEERS, at *St. George's*, *Fort Cunningham*, and *Walsingham.*

DATE.	STRENGTH.						ATTACKS.						DEATHS.						REMARKS.
	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	
1864:																			
26 July	–	–	6	162	16	27	–	–	–	–	1	1	–	–	–	–	–	–	
27 „	–	–	6	156	16	27	–	–	–	1	–	–	–	–	–	–	–	–	Six men invalided, &c.
1 August	–	–	–	–	–	–	–	–	–	1	1	1	–	–	–	–	–	–	
2 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
3 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
4 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
5 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
6 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
7 „	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	
8 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
9 „	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	
10 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
11 „	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	
12 „	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	
13 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
14 „	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	
15 „	–	–	–	–	–	–	–	–	–	2	1	2	–	–	–	–	–	–	
16 „	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–	
17 „	–	–	–	–	–	–	–	–	–	4	–	1	–	–	–	–	–	–	
18 „	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	2	–	–	
19 „	–	–	6	154	16	27	–	–	1	1	–	–	–	–	–	1	–	–	
20 „	–	–	6	153	16	27	–	–	–	3	2	2	–	–	–	2	–	–	
21 „	–	–	6	157	16	27	–	–	–	7	–	–	–	–	–	–	–	–	
22 „	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	
23 „	–	–	6	–	–	–	–	–	–	4	–	–	–	–	1	1	1	–	
24 „	–	–	5	150	15	27	–	–	–	–	–	–	–	–	–	1	–	–	
25 „	–	–	5	149	15	27	–	–	–	–	–	–	–	–	–	1	1	–	
26 „	–	–	5	148	14	27	–	–	–	4	–	1	–	–	1	–	–	–	
27 „	–	–	4	148	14	27	–	–	–	6	–	–	–	–	–	–	–	–	
28 „	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	
29 „	–	–	–	–	–	–	–	–	–	4	–	–	–	–	–	3	–	–	
30 „	–	–	4	145	14	27	–	–	1	1	–	–	–	–	–	–	–	–	
31 „	–	–	–	–	–	–	–	–	–	5	–	–	–	–	–	–	–	–	
1 September	–	–	–	–	–	–	–	–	–	5	–	1	–	–	–	–	–	–	
2 „	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	1	–	–	Two admissions at Walsingham.
3 „	–	–	4	144	14	27	–	–	–	2	–	1	–	–	–	3	–	–	One admission at Ferry Point, from Walsingham.
4 „	–	–	4	141	14	27	–	–	–	1	1	1	–	–	–	1	–	–	
5 „	–	–	4	140	14	27	–	–	–	1	–	–	–	–	–	–	–	–	
6 „	–	–	–	–	–	–	–	–	–	3	1	–	–	–	–	2	–	–	
7 „	–	–	4	138	14	27	–	–	–	1	–	–	–	–	–	–	–	–	
8 „	–	–	–	–	–	–	–	–	–	3	1	–	–	–	–	1	–	–	
9 „	–	–	4	137	14	27	–	–	–	–	–	–	–	–	–	2	–	–	
10 „	–	–	4	135	14	27	–	–	–	–	–	–	–	–	–	1	–	–	
11 „	–	–	4	134	14	27	–	–	–	2	–	–	–	–	–	1	–	–	
12 „	–	–	4	133	14	27	–	–	–	–	–	–	–	–	–	–	–	–	
13 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
14 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
15 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
16 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
17 „	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	One admission at Walsingham.
18 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
19 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
20 „	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	One admission at Ferry Point, from Walsingham.
21 „	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	
22 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
23	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	
24 „	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	2	–	–	One death at Ferry Point, from Walsingham.
25 „	–	–	4	131	14	27	–	–	–	1	–	–	–	–	–	–	–	–	
26 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
27 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
28 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
29 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
30 „	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
11 October	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	
16 „	–	–	–	–	–	–	–	1	*1	–	–	–	–	–	–	–	–	–	* Captain Walker.
September	–	–	4	129	14	27	–	–	–	† 2	–	–	–	–	–	† 2	–	–	† Sappers, Lock & Rogers, in passage, and at Halifax, N. S.

W. G. Hamley, Colonel,
Commanding Royal Engineers.

(G.)—GENERAL RETURN of STATISTICS of YELLOW FEVER in the ROYAL ARTILLERY at *St. George's* and *Ireland Island*.

DATE.	Barrack or Encampment (if possible) where Attacked.	OCCUPATION.					ATTACKS.					DEATHS.					REMARKS.
		Officers.	Officers' Wives and Children.	Men.	Mens' Wives and Children.	Others.	Officers.	Officers' Wives and Children.	Men.	Mens' Wives and Children.	Others.	Officers.	Officers' Wives and Children.	Men.	Mens' Wives and Children.	Others.	
1864:	ST. GEORGE'S:																
25 July - - -	Patients in hospital -	–	–	(*a*) 4	–	–	–	–	2	–	–	–	–	2	–	–	(*a*) These men were in the old Royal Artillery Hospital when the fever broke out; two caught it and died.
25 July to 11 Oct. -	Hospital orderlies -	–	–	10	–	–	–	–	9	–	–	–	–	4	–	–	
25 July to 19 Aug. -	Military prisons -	–	–	8	–	–	–	–	5	–	–	–	–	nil	–	–	
6 Aug. to 31 Aug.	Fort George - -	–	–	3	–	–	–	–	2	–	–	–	–	1	–	–	
6 Aug. to 17 July	Fort Victoria - -	–	–	80	–	–	–	–	nil	–	–	–	–	nil	–	–	
6 Aug. to 8 Aug. -	Civil prison - -	–	–	1	–	–	–	–	1	–	–	–	–	nil	–	–	
18 July to 16 Aug. -	Camp Fort Victoria -	–	–	82	–	–	–	–	10	–	–	–	–	1	–	–	(*b*) Lieutenant W. R. Molesworth, though living at Camp Fort Cunningham, visited St. George's daily as Acting Fort Adjutant. He contracted fever, was treated, and died at St. George's.
17 Aug. to 17 Nov.	Camp Fort Cunningham	3	–	67	–	–	3	–	27	–	–	(*b*)1	–	5	–	–	
17 Aug. to 17 Nov.	Remaining at St. George's	(*c*)3	1	about 25	8	–	(*c*)4	1	22	5	–	1	–	7	2	–	
TOTAL at ST. GEORGE'S - - -		6	1	113	8	–	7	1	78	5	–	2	–	20	2	–	(*c*) Assistant Surgeon Burland attacked twice.
	IRELAND ISLAND:																
13 Aug. to 25 Aug.	Casemate barracks -	1 } Lt. Rooke.	–	78	–	–	–	–	2	–	–	–	–	nil	–	–	
25 Aug. to 24 Sept.	Camp Glacis - -	1	–	80	–	–	–	–	30	–	–	–	–	9	–	–	
25 Aug. to 11 Oct. -	Quarters Boaz - -	2	2	2	5	–	2	1	–	–	–	nil	nil	–	–	–	
13 Sept. to 29 Sept.	Gibb's Hill - -	–	–	1	–	–	–	–	1	–	–	–	–	nil	–	–	
TOTAL at IRELAND ISLAND - -		3	2	82	5	.	2	1	33	–	–	–	–	9	–	–	
GRAND TOTAL, R. A. - - -		9	3	*195	13	–	†9	2	111	5	–	2	–	29	2	–	

* The totals of men in this column represent the strength on the 31st July, the date of the first death. It is evident that adding the several figures would give no result, as the same men are shewn in different quarters or camps.

† In the column for officers nine attacks are shown. Only eight caught the fever, but Assistant Surgeon Burland had a second attack.

T. Robinson, Lieutenant Colonel,
Commandant, Royal Artillery, Bermuda.

(H.)—DAILY RETURN of YELLOW FEVER STATISTICS in the ROYAL ARTILLERY.

DATE.	STRENGTH.						ATTACKS.						DEATHS.						REMARKS.
	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	
24 July 1864 -	–	–	8	208	10	6	–	–	–	1	–	–	–	–	–	–	–	–	
26 " " -	–	–	–	–	–	–	–	–	(*a*)1	–	–	–	–	–	–	–	–	–	(*a*) Assistant Surgeon Burland; 1 man from Halifax, 26th; 1 serjeant and 13 men to England, 27th.
27 " " -	–	–	8	209	10	6	–	–	–	–	–	–	–	–	–	–	–	–	
28 " " -	–	–	8	195	10	6	–	–	–	–	–	–	–	–	–	–	–	–	
31 " " -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	
3 Aug. " -	–	–	8	194	10	6	–	–	–	1	–	–	–	–	–	–	–	–	
4 " " -	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	
5 " " -	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	
6 " " -	–	–	8	194	10	5	–	–	–	1	–	–	–	–	–	–	–	–	
7 " " -	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	
8 " " -	–	–	–	–	–	–	–	–	–	(*b*)1	–	–	–	–	–	–	–	–	(*b*) Treated in civil prisons.
10 " " -	–	–	–	–	–	–	–	–	(*c*)1	1	1	–	–	–	–	–	–	–	(*c*) Colonel Grayson.
11 " " -	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	2	–	–	
12 " " -	–	–	8	192	10	5	–	–	–	–	1	–	–	–	–	–	–	–	
13 " " -	–	–	–	–	–	–	–	–	–	4	–	–	–	–	–	–	–	–	
14 " " -	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	
15 " " -	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	
16 " " -	–	–	–	–	–	–	–	–	–	4	–	–	–	–	–	–	–	–	
17 " " -	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	1	–	–	
19 " " -	–	–	8	191	10	5	–	–	–	4	1	–	–	–	–	–	–	–	
20 " " -	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	1	–	–	
21 " " -	–	–	8	190	10	5	–	–	–	4	–	–	–	–	–	–	–	–	
23 " " -	–	–	9	190	10	5	–	–	–	1	–	–	–	–	–	1	–	–	(*d*) Lieutenant W. T. Scott joined from leave.
25 " " -	–	–	9	189	10	5	–	–	–	4	–	–	–	–	–	–	–	–	

(H.)—Daily Return of Yellow Fever Statistics in the Royal Artillery—*continued.*

DATE.	STRENGTH.						ATTACKS.						DEATHS.						REMARKS.
	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	
1864:																			
26 August	–	–	9	189	10	5	–	–	*1	2	–	–	–	–	–	–	–	–	*Captain F. Cromartie.
27 ,,	–	–	–	–	–	–	–	–	*1	7	1	–	–	–	–	–	–	–	*Lieutenant F. W. Carey.
28 ,,	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	
29 ,,	–	–	–	–	–	–	–	–	*1	–	–	–	–	–	–	–	–	–	*Lieutenant W. T. Scott.
30 ,,	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	
31 ,,	–	–	–	–	–	–	–	–	–	9	–	–	–	–	–	1	–	–	
1 September	–	–	9	188	10	5	–	–	–	2	–	–	–	–	–	–	–	–	
2 ,,	–	–	–	–	–	–	–	–	*1	4	–	–	–	–	–	2	1	–	*Dr. B. Burland; second attack.
3 ,,	–	–	9	186	9	5	–	–	–	2	–	–	–	–	–	2	–	–	
4 ,,	–	–	9	184	9	5	–	–	–	4	–	–	–	–	–	2	–	–	
5 ,,	–	–	9	182	9	5	–	–	*1	2	–	–	–	–	–	–	–	–	*Lieutenant C. A. Gorham.
6 ,,	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	1	–	–	
7 ,,	–	–	9	181	9	5	–	–	–	1	–	–	–	–	–	1	–	–	
8 ,,	–	–	9	180	9	5	–	–	*1	2	–	–	–	–	–	–	–	–	*Lieutenant W. R. Molesworth.
9 ,,	–	–	–	–	–	–	–	–	–	3	1	–	–	–	–	3	–	–	
10 ,,	–	–	9	177	9	5	–	–	–	–	–	–	–	–	–	1	–	–	
11 ,,	–	–	9	176	9	5	–	–	–	–	–	–	–	–	*1	–	–	–	*Lieutenant W. T. Scott.
12 ,,	–	–	8	176	9	5	–	–	–	4	–	–	–	–	–	1	–	–	
13 ,,	–	–	8	175	9	5	–	–	–	3	–	–	–	–	–	1	–	–	
15 ,,	–	–	8	174	9	5	–	–	–	1	–	–	–	–	*1	–	–	–	*Lieutenant W. R. Molesworth.
16 ,,	–	–	7	174	9	5	–	–	*1	–	–	–	–	–	–	1	–	–	*Major J. E. Hope.
17 ,,	–	–	7	173	9	5	–	–	–	2	–	–	–	–	–	–	–	–	
18 ,,	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	
19 ,,	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	2	–	–	
20 ,,	–	–	7	171	9	5	–	–	–	2	–	–	–	–	–	–	–	–	
21 ,,	–	–	6	171	9	5	–	–	–	3	–	–	–	–	–	–	–	–	Colonel G. Graydon, left 20th.
23 ,,	–	–	7	171	9	5	–	–	–	–	–	–	–	–	–	–	–	–	Lieut. R. T. Millett, from leave.
24 ,,	–	–	5	101	9	5	–	–	–	1	–	–	–	–	–	1	–	–	2 officers, 70 men, to Halifax.
26 ,,	–	–	5	100	9	5	–	–	–	1	–	–	–	–	–	–	–	–	
27 ,,	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	
28 ,,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	
29 ,,	–	–	5	99	9	5	–	–	–	1	–	–	–	–	–	1	–	–	
1 October	–	–	5	98	9	5	–	–	–	1	–	–	–	–	–	1	–	–	
3 ,,	–	–	5	97	9	5	–	–	–	–	–	–	–	–	–	1	–	–	The last death.
9 ,,	–	–	5	96	9	5	–	–	–	1	–	–	–	–	–	–	–	–	
11 ,,	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	The last case.

S. Robinson, Lieut. Colonel,
Commanding Royal Artillery.

(I.)—GENERAL RETURN of Yellow Fever Statistics in the Barrack Department.

DATE.	STRENGTH.						ATTACKS.						DEATHS.						REMARKS.
	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	
1864:																			
July to December	10	–	–	2	2	6	–	–	–	–	1	3	–	nil	nil	–	–	–	In this return no account has been taken of the acting barrack-master, acting barrack serjeant, or military labourers: as, being soldiers, they will, doubtless, be accounted for in regimental returns.
Temporarily employed during November and part of October.	1	10	–	10	–	1	–	–	nil	nil	–	–	–	–	–	–	–	–	It is worthy of remark that although the persons employed in this department were continually in contact with most filthy infected bedding, much of which was washed, and the hair picked and re-made,* they were singularly fortunate in escaping; this applies also to the military labourers, &c., and appears an argument against infection.

* About 22 persons (11 natives, 11 soldiers) were employed daily at this work for a considerable time.

C. A. Gorham, Lieuenant, R. A.,
Acting Barrack Master.

(J.)—MILITARY STORE DEPARTMENT.

OCCUPATION RETURN of STATISTICS of YELLOW FEVER in the MILITARY STORE DEPARTMENT.

DATE.	Barrack or Encampment (if possible) where Attacked.	OCCUPATION.					ATTACKS.					DEATHS.					REMARKS.
		Officers.	Officers' Wives and Children.	Men.	Men's Wives and Children.	Others.	Officers.	Officers' Wives and Children.	Men.	Men's Wives and Children.	Others.	Officers.	Officers' Wives and Children.	Men.	Men's Wives and Children.	Others.	
1864:	IRELAND ISLAND:																
15 August -	Commissioner's House -	*1	*4	–	–	–	1	–	–	–	–	–	–	–	–	–	* Removed to Ordnance Island 1st October 1864.
19 August -	Lodge Point - - -	–	–	3	6	–	–	–	1	–	–	–	–	1	–	–	
	ST. GEORGE'S:																
19 October -	Ordnance Island - -	1	4	–	–	–	–	2	–	–	–	–	–	–	–	–	
17 August -	Town of St. George's -	1	3	†5	†11	–	1	1	2	–	–	1	–	–	–	–	† Of this number 4 were coloured men and 2 white men. Women and children coloured.
September	Hen Island - - -	–	–	†1	†5	–	–	–	–	4	–	–	–	–	–	–	

MONTHLY RETURN of YELLOW FEVER STATISTICS in the MILITARY STORE DEPARTMENT.

DATE.	STRENGTH.						ATTACKS.						DEATHS.						REMARKS.
	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	Europeans, &c.	Natives.	Officers.	Men.	Women.	Children.	
IRELAND ISLAND:																			
August - - - -	13	1	1	3	2	8	2	–	1	1	–	–	1	–	–	1	–	–	
September - - -	6	–	1	1	1	3	–	–	–	–	–	–	–	–	–	–	–	–	
October - - - -	2	8	–	3	1	6	–	–	–	–	–	–	–	–	–	–	–	–	
November - - -	2	8	–	3	1	6	–	–	–	–	–	–	–	–	–	–	–	–	
ST. GEORGE'S:																			
August - - - -	14	16	2	6	5	17	5	–	1	2	–	2	1	–	1	–	–	–	
September - - -	2	14	–	6	3	7	–	4	–	–	–	4	–	–	–	–	–	–	
October - - - -	7	14	1	6	4	10	3	–	–	–	1	2	–	–	–	–		–	
November - - -	7	14	1	6	4	10	–	–	–	–	–	–	–	–	–	–	–	–	

Note.—In this return it is understood that the two first columns of each section, namely, those for "Europeans, &c." and "Natives," include the remaining columns, consequently they agree in total number with the other totals severally.

The records of the Military Store Department do not admit of a daily return of attacks of yellow fever being furnished.

19 May 1865.

S. B. Maclean,
Assistant Superintendent of Stores.

(K.)—GENERAL RETURN of STATISTICS of YELLOW FEVER in the NAVAL ESTABLISHMENT at *Bermuda*. (Fixed.)

DATES of Earliest and Latest Cases referred to in this Return.	POPULATION.								ATTACKS.								DEATHS.						REMARKS.
	NAVAL.		MILITARY MARINES.	CIVILIANS.					NAVAL.		MILITARY MARINES.	CIVILIANS.					NAVAL.		MILITARY MARINES.	CIVILIANS.			
	White.	Men.	Men.	White.	Coloured.	Men.	Women.	Children under 14.	White.	Men.	Men.	White.	Coloured.	Men.	Women.	Children under 14.	White.	Men.	Men.	White.	Men.	Children under 14.	
Between 1st June and 31st December 1864.	98	98	98	335	95	158	120	152	46	46	12	146	16	47	44	71	15	15 *8	3 *3	10	5	5	* Died at Halifax.

From *Captain Wainwright*, R.N.,
Superintendent of Naval Establishment, Bermuda.
Brownlow Gray.

(L.)—GENERAL RETURN of STATISTICS of YELLOW FEVER in Her Majesty's Ships.

DATE.	ANCHORAGE.	NAME OF SHIP.		STRENGTH OF CREW.		ATTACKS.		DEATHS.		REMARKS.
		Her Majesty's.	Others.	White.	Coloured.	White.	Coloured.	White.	Coloured.	
1864:				Contemplated about						
15 July	Camber	"Orontes"	-	170	-	–	-	–	-	Left on 27 July.
	Grassy Bay	"Jason"	-	270	-	–	-	–	-	Left on 30 „
	Camber	"Lily"	-	90	-	–	-	–	-	Left on 7 Aug.
18 Aug.	Ditto	-	"Sir G. F. Seymour"	Unknown	-	–	-	–	-	
23 „	-	-	"Francis Drake"	„	-	–	-	–	-	Left on 30 Aug.
24 „	Grassy Bay	"Jason"	-	270	-	–	-	–	-	Left on 25 „
1 Sept.	Camber	-	"Eliza Olive"	Unknown	-	–	-	–	-	Left on 25 Oct.
6 „	Ditto	-	"Balcombe"	„	-	–	-	–	-	Left on 27 Sept.
6 „	Grassy Bay	"Galatea"	-	560	-	–	-	–	-	Left on 10 „
9 „	Ditto	"Bulldog"	-	170	-	–	-	–	-	Left on 14 „
20 „	Ditto	"Galatea"	-	560	-	–	-	–	-	Left on 24 „
24 „	Ditto	"Cygnet"	-	65	-	–	-	–	-	Left on 24 „
1 Oct.	Ditto	"Fawn"	-	130	-	–	-	–	-	Left on 2 Oct.
1 „	Camber	-	"Eastern Vale"	Unknown	-	2	-	2	-	Left on 25 „
4 „	Grassy Bay	"Barracouta"	-	170	-	–	-	–	-	Left on 24 „
7 „	Ditto	"Virago"	-	170	-	–	-	–	-	Left on 7 „
9 „	Ditto	"Steady"	-	65	-	–	-	–	-	Left on 12 „
15 „	Ditto	"Jason"	-	270	-	–	-	–	-	Left on 17 „
24 „	Camber	-	"Only Son"	Unknown	-	–	-	–	-	
28 „	Ditto	-	"Lady Milne" „	„	-	–	-	–	-	Left on 29 Nov.
8 Nov.	Ditto	"Cygnet"	-	65	-	–	-	–	-	Left on 24 Nov.
9 „	Grassy Bay	"Wolverine"	-	270	-	–	-	–	-	Left on 27 Dec.
16 „	Camber	"Media"	-	140	-	–	-	–	-	Left on 20 Nov.
17 „	Ditto	"Steady"	-	65	-	-	-	–	-	Left on 7 Dec.
29 „	Ditto	-	"Urgent"	Unknown	-	–	-	–	-	Left on 9 Jan.
5 Dec.	Ditto	"Virago"	-	170	-	–	-	–	-	Left on 31 Dec.
7 „	Ditto	"Challenger"	-	275	-	–	-	–	-	Left on 31 „
8 „	Ditto	-	"Tyro"	Unknown	-	–	-	–	-	Left on 20 Jan.
18 „	Grassy Bay	"Duncan"	-	850	-	–	-	–	-	Left on 14 „
24 „	Camber	-	"Mavourneen"	Unknown	-	–	-	–	-	Left on 5 Feb.

(R.)

1864.

METEOROLOGICAL NOTES abstracted from the Log kept by Captain *Pullen*, R.N., on Surveying Service at *Bermuda;* at *Hamilton, Bermuda;* and on board H.M.S. "Arbacore," in Hamilton Harbour.

JANUARY.

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
1 Jan.	–	S.E. -	2 to 3 -	b. c. -	30·30	69·
	2 p.m.	S.E. -	2 -	b. c. -	30·24	74·
	10 „	S.E. -	2 -	b. c. -	30·27	70·
2 „	6 a.m.	S.S.W. -	3 to 4 -	b. c. p.	30·29	67·
	2 p.m.	W. -	2 to 4 -	a. c. p.	30·30	72·
	10 „	W.N.W. -	2 to 4 -	c. p. -	30·35	67·
3 „	6 a.m.	N.W. -	2 to 3 -	c. g. -	30·38	64·
	2 p.m.	N.W. -	2 to 3 -	b. c. -	30·40	70·
	10 „	–	2 to 3 -	c. -	30·42	62·
4 „	6 a.m.	N.E. -	–	b. c. -	30·38	62·
	2 p.m.	N.E. -	2 -	b. c. -	30·30	75·
	10 „	E. - -	2 -	b. c. -	30·30	67·
5 „	4 a.m.	S. - -	4 -	b. c. -	30·24	67·
	10 „	S.W. -	4 -	b. c. -	30·20	73·
	10 p.m.	W.S.W. -	3 to 4 -	b. c. -	30·18	67·
6 „	4 a.m.	W. -	4 -	c. g. p.	30·19	67·
	noon -	–	4 to 5 -	c. g. p.	30·20	71·
	10 p.m.	N.W. -	3 to 4 -	c. p. -	30·21	68·
7 „	6 a.m.	W. -	1 -	b. c. -	30·23	68·
	2 p.m.	S.W. -	2 to 3 -	b. c. p.	30·21	75·
	10 „	S.W. -	2 -	b. c. -	30·20	70·
8 „	4 a.m.	W. -	4 to 5 -	b. c. -	30·10	70·
	noon -	W. -	3 to 5 -	b. c. -	30·00	75·
	10 p.m.	W.N.W. -	4 to 5 to 6	b. c. q.	29·96	70·
9 „	4 a.m.	W.N.W. -	4 -	c. p. -	30·00	68·
	noon -	W.N.W. -	4 -	c. p. -	30·04	73·
	10 p.m.	W.N.W. -	4 to 5 -	b. c. p.	30·18	68·
10 „	6 a.m.	W. -	4 -	c. -	30·25	67·
	2 p.m.	N.W. -	2 to 3 -	b. c. -	30·27	74·
	10 „	W.N.W. -	3 to 4 -	b. c. -	30·28	70·
11 „	6 a.m.	W.S.W. -	4 -	b. c. -	30·26	66·
	2 p.m.	W.S.W. -	4	b. c. p.	30·20	73·
	10 „	W. -	3 -	c. -	30·15	67·
12 „	4 a.m.	–	–	–	30·18	67·
	6 „	W.N.W. -	3 to 4 -	b. c. -	–	–
	noon -	–	–	–	30·20	75·
	2 p.m.	W.N.W. -	2 to 1 -	b. c. -	–	–
	10 „	W.N.W. -	2 to 3 -	b. c. p.	30·21	69·
13 „	4 a.m.	–	–	–	30·22	67·
	6 „	W. -	3 -	b. c. -	–	–
	2 p.m.	S.W. -	2 to 3 -	b. c. -	30·22	75·
	10 „	S.W. -	2 to 4 -	b. c. -	30·23	71·
14 „	4 a.m.	–	–	–	30·24	70·
	6 „	S.W. -	3 to 4 -	b. c. -	–	–
	2 p.m.	S.S.W. -	3 to 4 -	b. c. -	30·21	76·
	10 „	S.S.W. -	3 to 4 -	b. c. -	30·25	71·
15 „	6 a.m.	S.S.W. -	4 -	b. c. -	30·28	70·
	2 p.m.	S.S.W. -	3 to 5 -	b. c. -	30·30	77·
	10 „	S.W. -	4 -	b. c. -	30·25	72·
16 „	6 a.m.	S.W. -	4 to 5 -	b. c. q.	30·20	71·
	2 p.m.	S.W. -	4 to 6 -	b. c. q.	30·22	76·
	10 „	S.W. -	4 to 6 -	b. c. p. q.	30·21	71·
17 „	6 a.m.	S.W. -	2 to 3 to 4	b. c. -	30·45	71·
	2 p.m.	W. -	4 -	b. c. -	30·40	77·
	10 „	N. -	2 to 5 -	b. c. -	30·40	72·
18 „	6 a.m.	E. - -	2 to 3 -	b. c. -	30·40	72·
	2 p.m.	N.E. -	3 -	–	30·38	77·
	10 „	E. - -	2 to 3 -	–	30·37	72·

JANUARY—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
19 Jan.	6 a.m.	S.E. -	2 to 3 -	b. c. -	–	–
	8 „	–	–	–	30·37	71·
	2 p.m.	S.E. -	3 -	b. c. -	30·32	73·
	10 „	S. - -	3 -	b. c. -	30·25	70·
20 „	6 a.m.	S.W. -	2 to 3 -	b. c. p.	30·30	71·
	2 p.m.	W. -	2 to 3 -	g. c. -	30·31	75·
	10 „	W.N.W.	2 -	g. c. -	30·35	69·
21 „	6 a.m.	N. - -	2 -	b. c. p.	30·39	66·
	2 p.m.	N. - -	2 -	b. c. -	–	–
	10 „	N.N.W.	2 to 3 -	b. c. -	30·45	65·
22 „	4 a.m.	S. - -	2 -	o. c. p.	30·40	62·
	noon -	S. - -	2 -	o. c. r.	30·29	67·
	10 p.m.	S. - -	2 -	o. c. p.	30·28	67·
23 „	6 a.m.	W.N.W.	3 -	o. c. p.	–	–
	8 „	–	–	–	30·298	67·
	2 p.m.	N.W. -	2 to 3 -	o. c. -	30·31	70·
	10 „	W.N.W.	3 -	b. c. -	30·33	64·
24 „	6 a.m.	W. -	2 -	b. c. -	30·30	64·
	2 p.m.	W. -	2 to 3 -	b. c. -	30·25	69·
	10 „	W. -	1 to 2 -	b. c. -	30·20	64·
25 „	6 a.m.	W.S.W.	3 -	b. c. -	30·19	67·
	2 p.m.	S.W. -	3 to 4 -	b. c. -	30·14	73·
	10 „	S.W. -	3 to 4 -	b. c. -	30·12	70·
26 „	6 a.m.	S.W. -	4 -	b. c. -	30·11	67·
	2 p.m.	S.W. -	3 to 4 -	b. c. -	30·10	73·
	10 „	S.W. -	3 -	b. c. -	30·09	70·
27 „	8 a.m.	N. - -	1 to 2 -	b. c. -	30·22	67·
	4 p.m.	N. - -	1 -	b. c. -	30·30	71·
	10 „	Calm -	–	b. c. -	30·34	67·
28 „	6 a.m.	E.N.E. -	1 to 2 -	b. c. -	–	–
	8 „	–	–	–	30·39	67·
	2 p.m.	N.E. -	1 to 2 -	b. c. -	30·40	70·
	10 „	Calm -	–	b. c. -	30·42	65·
29 „	8 a.m.	S.E. -	2 -	b. c. -	30·354	64·
	2 p.m.	S.E. -	2 to 3 -	b. c. -	30·32	70·
	10 „	S.E. -	3 to 4 -	b. c. p.	30·30	67·
30 „	2 a.m.	–	–	o. c. r.	–	–
	6 „	S. - -	2 -	o. c. p.	30·27	64·
	noon -	S. - -	2 -	o. c. p.	30·24	70·
	8 p.m.	S. - -	2 -	o. c. -	–	–
	10 „	–	–	–	30·22	67·
31 „	6 a.m.	S.W. -	2 -	–	–	–
	8 „	–	–	b. c. -	30·21	69·
	2 p.m.	S.W. -	2 -	b. c. -	30·20	72·
	10 „	W.S.W. -	2 to 3 -	b. c. -	30·20	68·

FEBRUARY.

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
1 Feb.	6 a.m.	W.N.W.	2 -	b. c. -	30·20	68·
	noon -	W.N.W.	2 -	b. c. -	–	–
	2 p.m.	–	–	–	30·21	72·
	8 „	W. -	2 -	b. c. -	–	–
	10 „	–	–	–	30·23	68·
2 „	6 a.m.	W.S.W.	1 to 2 -	b. c. -	30·15	68·
	2 p.m.	W. -	1 to 2 -	b. c. -	30·12	72·
	10 „	W. -	1 to 2 -	b. c. -	30·08	68·
3 „	6 a.m.	S.W. -	4 -	c. -	29·88	70·
	2 p.m.	S.W. -	4 -	b. c. -	29·764	74·
	10 „	S.W. -	4 to 6 -	c. q. ret.	29·72	70·

Meteorological Notes abstracted from the Log kept by Captain *Pullen*, r.n., &c.—*continued.*

FEBRUARY.

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
4 Feb.	8 a.m.	N.W. -	5 to 6 -	b. c. q. p.	29·90	70·
	2 p.m.	N.W. -	5 -	b. c. q.	29·96	74·
	10 ,,	N.W. -	4 to 5 -	b. c. q.	30·04	70·
5 ,,	6 a.m.	S. - -	3 -	b. c. -	30·20	70·
	2 p.m.	S.S.E. -	3 to 4 -	b. c. p.	30·19	74·
	10 ,,	S.E. -	3 to 5 -	b. c. q. p.	30·17	69·
6 ,,	6 a.m.	S. - -	2 to 3 -	c. p. d.	30·20	70·
	2 p.m.	S. - -	2 to 3 -	c. p. -	30·20	74·
	10 ,,	S. - -	2 to 3 -	c. p. -	30·20	72·
7 ,,	6 a.m.	S. - -	4 to 5 -	c. p. -	30·19	72·
	2 p.m.	S.S.W. -	4 to 5 -	c. p. -	30·17	76·
	10 ,,	S.S.W. -	4 to 6 -	c.p.q.l.t.	30·15	72·
8 ,,	6 a.m.	S.W. -	2 to 3 -	b. c. -	30·13	70·
	2 p.m.	S.W. -	3 -	b. c. -	30·11	74·
	10 ,,	S.W. -	3 -	b. c. -	30·12	68·
9 ,,	6 a.m.	W.N.W. -	3 -	b. c. -	30·12	70·
	2 p.m.	W. -	3 -	b. c. -	30·10	75·
	10 ,,	W. -	3 to 4 -	b. c. p.	30·11	69·
10 ,,	6 a.m.	W.N.W. -	3 -	b. c. -	30·15	70·
	2 p.m.	W.N.W. -	3 -	b. c. -	30·14	74·
	10 ,,	W. -	3 to 5 -	b. c. p. q.	30·11	70·
11 ,,	6 a.m.	N. - -	4 to 5 -	b. c. q.	30·21	63·
	noon	N. - -	5 -	b. c. q.	30·28	66·
	10 p.m.	N. - -	4 to 5 -	b. c. q.	30·34	60·
12 ,,	6 a.m.	N. - -	1 -	b. c. -	30·20	61·
	noon	Calm -	0 -	b. c. -	30·10	65·
	2 p.m.	Variable -	1 -	–	–	–
	6 ,,	S. - -	2 -	–	–	–
	8 ,,	–	–	b. c. p.	30·02	66·
	10 ,,	S. - -	2 -	–	–	–
13 ,,	6 a.m.	S. - -	2 -	o. c. p.	29·90	67·
	2 p.m.	Variable -	2 -	b. c. p.	29·91	71·
	10 ,,	N. - -	2 to 3 -	b. c. -	29·93	67·
14 ,,	8 a.m.	N. - -	3 -	b. c. -	29·96	67·
	4 p.m.	–	–	–	30·00	71·
	10 ,,	N. - -	3 -	b. c. -	30·00	67·
15 ,,	6 a.m.	N. - -	4 -	b. c. q.	30·05	66·
	10 ,,	N.W. -	4 -	–	–	–
	2 p.m.	N. - -	4 to 5 -	b. c. q.	30·00	70·
	6 ,,	N.W. -	4 to 5 -	–	–	–
	10 ,,	N. - -	4 to 5 -	b. c. q.	–	–
	midnight	N.W. -	–	–	29·94	66·
16 ,,	6 a.m.	W.S.W. -	5 to 6 -	b. c. q.	29·79	66·
	2 p.m.	W.S.W. -	5 to 6 -	b. c. q.	29·69	73·
	6 ,,	–	–	c. q. v.	–	–
	10 ,,	W. -	5 to 6 -	c. q. v.	29·74	67·
17 ,,	8 a.m.	S.W. -	5 -	b. c. q.	29·80	67·
	2 p.m.	S.W. -	5 -	b. c. q.	29·90	71·
	10 ,,	W. -	5 -	b. c. q.	30·05	66·
18 ,,	6 a.m.	N.W. -	4 -	b. c. -	–	–
	8 ,,	–	–	–	30·37	62·
	2 p.m.	N.W. -	3 to 4 -	b. c. -	–	–
	4 ,,	–	–	–	30·42	65·
	8 ,,	N. - -	3 -	b. c. -	–	–
	10 ,,	–	–	–	30·51	62·
19 ,,	6 a.m.	S.E. -	4 -	b. c. p. q.	30·30	67·
	noon	–	–	–	30·15	71·
	2 p.m.	S.E. -	4 to 5 -	c. p. q.	–	–
	10 ,,	S.S.W. -	5 -	c. p. q.	30·05	67·
20 ,,	6 a.m.	E.N.E. -	3 to 4 -	o. c. p.	30·05	62·
	2 p.m.	E.N.E. .	3 to 4 -	o. c. p.	30·05	67·
	8 ,,	E.N.E. .	3 to 4 -	o. c. p.	30·06	62·
21 ,,	6 a.m.	N.E. -	2 to 3 -	b. c. -	30·08	63·
	2 p.m.	N.E. -	2 to 3 -	b. c. -	30·10	67·
	10 ,,	N.E. -	3 -	b. c. -	30·12	64·
22 ,,	6 a.m.	N. - -	1 -	b. c. -	30·14	62·
	2 p.m.	N.N.E. -	1 to 2 -	b. c. -	30·16	67·
	10 ,,	E.S.E. -	1 to 2 -	b. c. -	30·18	63·

FEBRUARY—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
23 Feb.	8 a.m.	W. -	2 -	b. c.	30·12	63·
	2 p.m.	W. -	4 -	b. c. q.	30·09	67·
	10 ,,	W. -	4 -	b. c. -	30·08	65·
24 ,,	6 a.m.	–	–	–	30·11	67·
	8 ,,	W.S.W. -	2 to 3 -	b. c. -	–	–
	noon -	–	–	–	30·12	72·
	2 p.m.	W.S.W. -	2 to 3 -	b. c. -	–	–
	6 ,,	S.W. -	–	–	–	–
	8 ,,	W.S.W. -	2 to 3 -	b. c. -	30·142	66·
25 ,,	6 a.m.	W. -	3 -	b. c. -	30·17	66·
	noon -	–	–	–	30·18	71·
	2 p.m.	W. -	3 -	b. c. -	–	–
	8 ,,	–	–	–	30·20	66·
	10 ,,	W.S.W. -	3 -	b. c. -	–	–
26 ,,	8 a.m.	S.W.	3 to 4 -	b. c. -	30·10	68·
	2 p.m.	S.S.W. -	3 to 5 -	b. c. q. -	30·00	73·
	8 ,,	S.S.W. -	4 to 6 -	b. c. q. l. t.	–	–
	10 ,,	–	–	–	29·90	68·
27 ,,	6 a.m.	–	–	–	29·96	67·
	8 ,,	W.N.W. -	5 to 6 -	b. c. q.	–	–
	2 p.m.	W.N.W. -	5 to 6 -	b. c. q.	30·06	71.
	8 ,,	N.W. -	4 to 5 -	b. c. q.	–	–
	10 ,,	–	–	–	30·22	61·
28 ,,	8 a.m.	W.N.W. -	1 to 2 -	b. c. -	30·26	64·
	2 p.m.	Calm -	0 -	b. c. -	30·29	68·
	10 ,,	Calm -	0 -	b. c. -	30·31	64·
29 ,,	6 a.m.	Calm -	0 -	b. c. -	30·34	65·
	2 p.m.	N. - -	1 -	b. c. -	30·37	68·
	10 ,,	N. - -	1 -	b. c. -	30·41	63·

MARCH.

Day.	Hour.	Direction.	Force.	Weather.	Bar.	Therm.
1 Mar.	8 a.m.	W. -	2 -	b. c. -	30·34	65·
	2 p.m.	W. -	2 -	b. c. -	30·30	69·
	10 ,,	W. -	2 -	b. c. -	30·25	66·
2 ,,	6 a.m.	S.W. -	4 to 5 -	b. c. q.	30·14	65·
	2 p.m.	S.W. -	4 to 5 -	b. c. q.	30·07	69·
	10 ,,	S.W. -	4 to 5 -	b. c. q.	30·03	66·
3 ,,	6 a.m.	N.N.E. -	3 to 5 -	c. g. q.	30·08	64·
	noon -	–	–	–	30·126	67·
	2 p.m.	N.N.E. -	5 -	c. g. q.	–	–
	10 ,,	N.N.E. -	4 to 5 -	c. q. -	30·14	64·
4 ,,	6 a.m.	N.E. -	3 to 4 -	b. c. -	–	–
	2 p.m.	E.N.E. -	3 -	c. g. -	–	–
	10 ,,	N.E. -	3 -	c. g. -	–	–
5 ,,	6 a.m.	E. - -	4 -	g. p. -	–	–
	2 p.m.	E. - -	4 to 5 -	g. p. -	–	–
	10 ,,	E. - -	4 -	g. -	–	–
6 ,,	6 a.m.	E. - -	2 to 3 -	b. c. -	–	–
	2 p.m.	E. - -	2 to 3 -	b. c. -	–	–
	10 ,,	Variable -	1 -	b. c. -	–	–
7 ,,	8 a.m.	S.W. -	4 to 5 -	b. c. -	–	–
	2 p.m.	S.W. -	4 to 5 -	b. c. -	–	–
	10 ,,	S.W. -	4 to 5 -	b. c. -	–	–
8 ,,	6 a.m.	W. -	1 to 2 -	b. c. -	–	–
	2 p.m.	W. -	2 to 3 -	b. c. -	–	–
	10 ,,	W. -	2 to 3 -	b. c. -	–	–
9 ,,	6 a.m.	W. -	2 to 3 -	b. c. -	–	–
	2 p.m.	W. -	2 to 3 -	b. c. -	–	–
	8 ,,	W.N.W. -	2 to 3 -	b. c. -	–	–
10 ,,	8 a.m.	W. -	2 -	b. c. -	–	–
	2 p.m.	W. -	2 to 3 -	b. c. -	–	–
	10 ,,	W. -	2 -	b. c. -	–	–
11 ,,	6 a.m.	S.W. -	3 -	b. c. p.	–	–
	2 p.m.	W.S.W. -	3 -	b. c. -	–	–
	10 ,,	W.N.W. -	2 to 3 -	b. c. -	–	–
12 ,,	8 a.m.	W. -	3 -	g. -	–	–
	2 p.m.	W. -	3 to 4 -	–	–	–
	4 ,,	–	–	c. -	–	–
	10 ,,	W. -	3 -	c. -	–	–

METEOROLOGICAL NOTES abstracted from the Log kept by Captain *Pullen*, R.N., &c.—*continued.*

M A R C H—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
13 March	8 a.m.	W. -	3 -	b. c. -	–	–
	4 p.m.	W. -	2 -	b. c. -	–	–
	10 ,,	W. -	2 -	b. c. -	–	–
14 ,,	6 a.m.	W. -	3 -	b. c. -	–	–
	2 p.m.	S.W. -	2 to 3 -	b. c. -	–	–
	10 ,,	W.S.W. -	2 to 3 -	b. c. -	–	–
15 ,,	6 a.m.	E. - -	1 to 2 -	b. c. -	–	–
	2 p.m.	N.E. -	2 to 3 -	v. c. -	–	–
	8 ,,	E. - -	2 to 5 -	v. q. -	–	–
16 ,,	6 a.m.	Variable -	3 to 5 -	o. c. q. p.	–	–
	2 ,,	W. -	4 to 6 -	b. c. q.	–	–
	10 ,,	W. -	4 to 6 -	b. c. q.	–	–
17 ,,	8 a.m.	N. - -	4 to 5 -	c. q. p.	–	–
	2 p.m.	N. - -	4 to 5 -	c. v. q.	–	–
	10 ,,	N. - -	4 to 5 -	c. p. q.	–	–
18 ,,	6 a.m.	N. - -	2 to 3 -	b. c. p.	–	–
	2 p.m.	N. - -	2 -	b. c. -	–	–
	10 ,,	N.W. -	1 to 2 -	b. c. -	–	–
19 ,,	8 a.m.	Calm -	0 -	b. c. -	–	–
	2 p.m.	Calm -	0 -	b. c. -	–	–
	8 ,,	Variable -	1 -	b. c. -	–	–
20 ,,	6 a.m.	S.W. -	2 -	b. c. -	–	–
	2 p.m.	S.W. -	2 to 3 -	b. c. -	–	–
	10 ,,	S.W. -	2 -	b. c. -	–	–
21 ,,	8 a.m.	S.W. -	3 -	b. c. -	30·144	65½
	2 p.m.	S.S.W. -	3 -	b. c. -	–	–
	8 ,,	S.W. -	2 to 3 -	b. c. -	–	–
	10 ,,	–	–	–	30·182	66½
22 ,,	8 a.m.	S.W. -	3 -	b. c. -	30·164	70·
	2 p.m.	S.W. -	3 to 4 -	b. c. -	30·132	73·
	8 ,,	S.W. -	4 to 5 -	c. q. -	–	–
	10 ,,	–	–	–	30·048	68·6
23 ,,	6 a.m.	–	–	–	29·88	69½
	8 ,,	S.W. -	5 to 6 -	c. q. p.	29·894	70·0
	2 p.m.	–	–	–	29·714	73½
	4 ,,	W.S.W. -	5 to 6 -	c. q. v.	–	–
	6 ,,	–	–	–	29·778	69½
	8 ,,	W. -	5 to 6 -	–	–	–
	10 ,,	W.N.W.	5 to 6 -	c. q. p.	29·81	66½
24 ,,	6 a.m.	W.N.W. -	7 to 8 -	c. q. p.	29·76	63½
	8 ,,	–	–	–	29·80	65½
	noon -	W.N.W. -	6 to 8 -	c. q. p.	–	–
	2 p.m.	–	–	–	29·872	64½
	8 ,,	W.N.W. -	5 to 7 -	c. q. p.	–	–
	10 ,,	–	–	–	29·968	58·
25 ,,	6 a.m.	N.N.W. -	3 to 5 -	c. -	30·14	59·
	2 p.m.	N.N.W. -	4 -	b. c. -	–	–
	10 ,,	N. - -	3 to 4 -	c. -	–	–
26 ,,	6 a.m.	Variable -	4 -	c. g. -	–	–
	noon -	W. -	4 -	c. p. -	–	–
	8 p.m.	W. -	4 -	c. q. p. t.	–	–
	10 ,,	–	–	–	–	–
27 ,,	–	–	–	–	29·678	64·6
	8 a.m.	W.N.W. -	3 to 5 -	c. q. p. l. t.	29·648	65·
	10 ,,	–	–	–	29·65	66·8
	2 p.m.	W.N.W. -	3 to 5 -	c. q. p. l. t.	29·6	69·5
	8 ,,	–	–	–	29·538	63.
	10 ,,	W.N.W. -	4 to 5 -	c. q. p.	29·528	64·
28 ,,	6 a.m.	–	–	–	29·62	62·8
	8 ,,	N.W. -	4 to 6 -	c. q. p.	29·66	62·8
	4 p.m.	N.W. -	4 to 6 -	c. q. p.	–	–
	10 ,,	N.W. -	4 to 6 -	c. q. p.	29·746	59·
29 ,,	6 a.m.	–	–	–	29·732	59½
	8 ,,	N.W. -	5 to 7 -	b. c. q. p.	29·752	62½
	2 p.m.	N.W. -	5 to 7 -	c. q. p.	–	–
	6 ,,	–	–	–	29·768	62·8
	8 ,,	–	–	–	29·745	62·2
	10 ,,	W.N.W. -	5 to 6 -	c. q. p.	29·746	62·

M A R C H—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
30 Mar.	6 a.m.	–	–	–	29·726	61·6
	8 ,,	N.Wy. -	5 to 6 -	b. c. q.	29·716	65·5
	2 p.m.	W.N.Wy.	5 to 7 -	c. q. p.	–	–
	4 ,,	–	–	–	29·588	69·
	6 ,,	–	–	–	29·592	66·
	10 ,,	Wy. -	5 to 6 -	c. q. p.	29·598	65·2
31 ,,	6 a.m.	W. - -	6 -	b. c. q.	29·584	65·
	10 ,,	–		–	29·604	68·6
	noon -	W.S.W. -	6 -	b. c. q.	–	–
	4 p.m.	–	–	b. c. q.	29·635	69½
	8 ,,	W. -	6 -	–	29·648	67·

A P R I L.

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
1 Apr.	6 a.m.	W. -	5 to 6 -	b. c. q.	29·716	63·5
	8 ,,	–	–	–	29·746	64·6
	noon -	Wy. -	5 to 6 -	b. c. q.	29·774	69·5
	6 p.m.	–	–	–	29·800	65·3
	8 ,,	Wy. -	5 to 6 -	–	29·830	64·
	10 ,,	Wy. -	5 to 6 -	b. c. q.	–	–
2 ,,	6 a.m.	S.W. -	4 -	b. c. -	29·80	63·6
	10 ,,	–	–	-	29·82	70·5
	2 p.m.	S. - -	5 to 6 -	b. c. q.	29·684	74·5
	8 ,,	–	–	–	29·568	69·5
	10 ,,	S. - -	5 to 6 -	b. c. q. l.	29·574	69·5
3 ,,	6 a.m.	W. -	6 -	b. c. q.	29·494	66·8
	10 ,,	–	–	–	29·502	70·
	2 p.m.	Wy. -	6 to 7 -	b. c. q.	29·470	71·5
	4 ,,	–	–	–	29·438	70·4
	8 ,,	–	–	–	29·396	64·5
	10 ,,	Wy. -	6 -	b. c. q.	29·398	65·5
4 ,,	6 a.m.	N.Wy. -	4 to 6 -	b. c. q.	29·444	65·
	10 ,,	–	–	–	29·55	67·5
	2 p.m.	N.Wy. -	5 -	b. c. q.	29·652	71·5
	8 ,,	W.N.W. -	4 to 5 -	b. c. q.	29·792	67·
	10 p.m.	–	–	–	29·814	67·
5 ,,	6 a.m.	Ey. -	1 to 2 -	b. c. -	29·888	65·5
	2 p.m.	S.E. -	2 to 3 -	c. g. p.	–	–
	4 ,,	–	–	–	29·92	67·8
	8 ,,	–	–	–	29·886	68·
	10 ,,	Sy. -	3 -	c. g. -	29·884	67·5
6 ,,	6 a.m.	S.W. -	3 -	b. c. -	29·75	67·5
	2 p.m.	S.W. -	3 -	b. c. -	–	–
	6 ,,	–	–	–	29·796	68·
	8 ,,	–	–	–	29·792	68·
	10 ,,	S. - -	3 to 5 -	c. p. -	29·805	68·
	midnight	–	–	–	29·795	68·
7 ,,	6 a.m.	S.W. -	3 -	b. c. -	29·712	69·
	2 p.m.	S.W. -	3 to 4 -	b. c. -	–	–
	6 ,,	–	–	–	29·712	68·5
	8 ,,	–	–	–	29·680	67·5
	10 ,,	S.W. -	3 to 4 -	b. c. -	29·674	67·0
8 ,,	6 a.m.	–	–	–	29·678	66·
	8 ,,	W. -	3 -	b. c. p.	29·800	67·5
	10 ,,	–	–	–	29·85	67·
	2 p.m.	W.N.W. -	3 -	b. c. p.	–	–
	8 ,,	W. -	3 -	b. c. p.	29·85	67·
	midnight	–	–	–	29·862	66·5
9 ,,	6 a.m.	–	–	–	29·910	66·5
	8 ,,	W.N.W. -	2 to 3 -	b. c. -	–	–
	2 p.m.	W. -	2 to 4 -	b. c. -	30·020	74·5
	6 ,,	–	–	–	30·046	66·5
	10 ,,	W. -	1 -	c. -	–	–
	midnight	–	–	–	30·042	66·5
10 ,,	8 a.m.	W. -	2 to 3 -	b. c. -	30·048	66·5
	10 ,,	–	–	–	30·092	72·
	4 p.m.	–	–	b. c. -	30·084	72·
	8 ,,	–	–	–	30·052	67·5
	10 ,,	W. -	2 to 3 -	b. c. -	30·062	57·
11 ,,	6 a.m.	W. -	2 -	c. v. -	29·94	67·5
	8 ,,	–		–	29·952	70·
	noon -	W. –	2 -	c. -	–	–
	6 p.m.	–	–	–	29·976	71·
	8 ,,	W. -	2 -	b. c. -	–	–
	10 ,,	–	–	–	30·072	66·5

METEOROLOGICAL NOTES abstracted from the Log kept by Captain *Pullen*, R.N., &c.—*continued.*

APRIL—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
12 April	6 a.m.	W.N.W.	2 to 3	b. c.	30·032	65·
	10 ,,	–	–	–	30·074	68·5
	noon	W.N.W.	2 to 3	b. c.	–	–
	6 p.m.	–	–	–	30·084	70·5
	10 ,,	–	–	–	30·128	65·
13 ,,	6 a.m.	–	–	–	30·104	64·5
	8 ,,	S.Wy.	2	b. c.	–	–
	2 p.m.	S.Wy.	2	b. c.	–	–
	4 ,,	–	–	–	30·102	71·
	8 ,,	S.Wy.	2 to 4	b. c.	30·082	67·
	10 ,,	–	–	–	30·514	66·
14 ,,	6 a.m.	30	–	–	30·022	66·5
	8 ,,	N.W.	3	b. c.	30·04	69·
	4 p.m.	N.W.	2 to 3	b. c.	30·078	70·5
	10 p.m.	W.N.W.	2 to 3	b. c.	–	–
	midnight	–	–	–	30·14	65·
15 ,,	6 a.m.	–	–	–	30·112	63·5
	8 ,,	W.	2 to 3	b. c.	–	–
	4 p.m.	W.	3 to 4	b. c.	30·024	69·
	10 ,,	W.S.W.	4 to 5	b. c. q.	30·00	65·
16 ,,	6 a.m.	–	–	–	29·918	72·5
	8 ,,	S.W.	6 to 7	c. p. q.	29·924	75·
	4 p.m.	S.Wy.	6 to 7	c. p. q.	29·832	75·
	10 ,,	S.W.	6 to 7	c. p. q. l.	29·800	75·6
	midnight	–	–	–	29·832	72·
17 ,,	6 a.m.	–	–	–	29·514	70·
	8 ,,	S.W.	4	b. c.	–	–
	10 ,,	–	–	–	30·02	71·
	2 p.m.	S.W.	3 to 4	b. c.	–	–
	6 ,,	–	–	–	30·072	67½
	10 ,,	S.W.	3 to 4	b.c.	30·192	65·
18 ,,	6 a.m.	–	–	–	30·144	67·
	8 ,,	W.N.W.	4	b. c.	–	–
	4 p.m.	W.	3	b. c.	–	–
	8 ,,	–	–	–	30·192	66·
	10 ,,	W.	3	b. c.	–	–
19 ,,	6 a.m.	–	–	–	30·012	64·4
	8 ,,	S.Wy.	4 to 5	b. c. q.	–	–
	4 p.m.	S.W.	5	b. c. q.	30·040	75·
	6 ,,	–	–	–	29·994	71·5
	10 ,,	S.W.	5 to 6	b. c. q.	–	–
	midnight	–	–	–	29·952	70·
20 ,,	6 a.m.	–	–	–	29·90	74·
	8 ,,	Sy.	5 to 6	c. q. v.	–	–
	2 ,,	Sy.	5 to 6	c. q. v.	–	–
	4 p.m.	–	–	–	29·912	74·5
	8 ,,	Sy.	4	b. c.	29·944	71·
	midnight	–	–	–	29·996	70·
21 ,,	6 a.m.	–	–	–	30·036	68·5
	8 ,,	S.	3 to 4	–	30·070	72·
	4 p.m.	S.W.	3 to 4	–	30·012	74·
	10 ,,	W.	2 to 4	–	30·202	66·
	midnight	W.N.W.	–	–	–	–
22 ,,	6 a.m.	W.N.W.	3 to 4	b. c.	30·274	65·
	8 ,,	–	–	–	30·300	67·
	2 p.m.	W.N.W.	3 to 4	b. c.	–	–
	6 ,,	–	–	–	30·342	68·5
	8 ,,	–	–	–	30·352	66·
	10 ,,	N.W.	4 to 5	b. c. q.	–	–
23 ,,	6 a.m.	Ny.	2 to 3	b. c.	30·398	64·
	2 p.m.	N.E.	2 to 3	b. c.	–	–
	10 ,,	N.E.	2 to 3	b. c.	30·432	64·
24 ,,	6 a.m.	–	–	–	30·410	65·5
	8 ,,	Ey.	1 to 2	b. c.	30·432	67·5
	4 p.m.	S.E.	1 to 2	b. c.	30·420	73·5
	8 ,,	–	–	–	·400	66·5
	10 ,,	S.E.	2	b. c.	·412	66·
25 ,,	6 a.m.	Sy.	1 to 2	b. c.	30·350	65·
	8 ,,	–	–	–	30·366	70·
	2 p.m.	S.E.	2 to 3	b. c.	–	–
	6 ,,	–	–	–	30·348	71·
	10 ,,	Sy.	2 to 3	b. c.	–	–
	midnight	–	–	–	31·316	68·

APRIL—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
26 April	6 a.m.	S.	2 to 3	b. c.	30·362	68·
	2 p.m.	S.W.	3	b. c.	–	–
	4 ,,	–	–	–	30·302	76·
	8 ,,	S.W.	3	b. c.	–	–
	10 ,,	–	–	–	30·112	71·
	midnight	–	–	–	·096	71·
27 ,,	4 a.m.	–	–	c. p.	–	–
	6 ,,	–	–	–	30·022	70·
	8 ,,	W.	3	c. v.	30·026	72·
	2 p.m.	W.	3	b. c.	29·958	78·5
	6 ,,	–	–	–	29·916	74·
	10 ,,	Wy.	3 to 4	b. c.	–	–
	midnight	–	–	–	29·926	71·
28 ,,	6 a.m.	–	–	–	29·896	69·
	8 a.m.	W.	4 to 5	b. c.	–	–
	4 p.m.	W.	4 to 5	b. c.	29·860	75·
	10 ,,	W.N.W.	4 to 5	c. p.	29·862	68·
29 ,,	6 a.m.	Wy.	3	b. c.	29·894	69·
	8 ,,	–	–	–	29·892	70·
	2 p.m.	W.N.W.	4 to 5	b. c.	29·922	72½
	6 ,,	–	–	–	29·922	69·
	8 ,,	Ny.	5 to 6	p. c.	–	–
	10 ,,	–	–	–	29·978	65·
30 ,,	6 a.m.	N.N.E.	3	b. c.	30·022	65·
	2 p.m.	N.E.	3	b. c.	30·098	71·6
	10 ,,	N.E.	2 to 3	b. c.	–	–
	midnight	–	–	–	30·096	65·

MAY.

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
1 May	8 a.m.	E.	1 to 2	b. c.	30·012	66·5
	2 p.m.	–	–	–	30·040	73·5
	4 ,,	E.	1 to 2	b. c.	–	–
	6 ,,	–	–	–	30·144	72·
	8 ,,	–	–	–	·132	67·5
	10 ,,	E.S.E.	1	b. c.	30·152	66·5
2 ,,	6 a.m.	Sy.	3 to 4	b. c.	30·102	66·
	2 p.m.	S.W.	3 to 4	b. c.	–	–
	4 ,,	–	–	–	30·142	75·
	6 ,,	–	–	–	30·132	70·
	10 ,,	S.W.	3 to 4	b. c.	30·144	69½
3 ,,	6 a.m.	Sy.	4	b. c.	30·138	70
	2 p.m.	Sy.	4	b. c.	–	–
	10 ,,	Sy.	3 to 4	b. c.	–	–
4 ,,	4 a.m.	–	–	c. v.	–	–
	8 ,,	Sy.	3 to 4	v. c.	–	–
	4 p.m.	Sy.	3 to 4	c. v.	–	–
	10 ,,	S.E.	4 to 6	c. q. v.	–	–
5 ,,	4 a.m.	Vble.	6 to 7	c. p. q.	–	–
	6 ,,	–	–	–	30·524	64½
	10 ,,	N.E.	–	–	–	–
	2 p.m.	–	6 to 7	c. p. q.	–	–
	4 ,,	N.E.	–	–	–	–
	10 ,,	N.E.	6 to 7	c. p. q.	–	–
6 ,,	6 a.m.	–	–	–	30·062	67·
	8 ,,	N.N.Ey.	6	c. q.	30·076	68·5
	2 p.m.	N.	6	c. q.	30·012	71·8
	6 ,,	–	–	–	29·992	68·5
	10 ,,	N.	5 to 6	c. q. p.	29·946	68·5
7 ,,	6 a.m.	N.E.	4	c.	30·028	67·5
	8 ,,	–	–	–	30·05	72·
	noon	–	–	–	30·094	77·5
	2 p.m.	N.E.	4	c.	–	–
	10 ,,	N.E.	3 to 5	c. q.	–	–
	midnight	–	–	–	30·062	69·
8 ,,	6 a.m.	E.S.E.	3	b. c.	30·	71·5
	10 ,,	–	–	–	30·004	76·5
	noon	S.E.	3 to 4	c. p.	29·994	77·5
	4 p.m.	–	–	–	29·928	72·5
	6 ,,	E	3 to 4	c. p.	29·886	70·8
	8 ,,	–	–	–	29·892	70·
	10 ,,	E.	3 to 4	–	29·886	71·

METEOROLOGICAL NOTES abstracted from the Log kept by Captain *Pullen*, R.N., &c.—*continued.*

M A Y—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
9 May	6 a.m.	Sy.	3	b. c.	29·796	70·
	10 ,,	–	–	–	29·826	71·
	2 p.m.	S.	3	b. c.	–	–
	6 ,,	–	–	–	29·826	71·
	10 ,,	Sy.	3	b. c.	–	–
	midnight	–	–	–	29·876	69·
10 ,,	6 a.m.	–	–	–	29·926	70·5
	8 ,,	N.E.	2 to 3	b. c.	–	–
	2 p.m.	N.E.	2	b. c.	–	–
	6 ,,	–	–	–	30·024	76·5
	8 ,,	N.E.	1	b. c.	–	–
	midnight	–	–	–	30·024	70·
11 ,,	6 a.m.	S.	2	b. c.	30·096	73·5
	2 p.m.	S.	2	b. c.	30·100	75·
	6 ,,	–	1	–	–	–
	10 ,,	–	–	–	30·102	71·
	midnight	Calm	–	b. c.	–	–
12 ,,	6 a.m.	Ey.	2 to 1	b. c.	30·084	69·
	2 p.m.	E.	2 to 3	b. c.	–	–
	midnight	–	–	–	30·090	71·5
13 ,,	6 a.m.	–	–	–	30·050	71·
	8 ,,	E.S.E.	4 to 5	b. c.	30·088	76·
	2 p.m.	E.S.E.	4 to 5	b. c.	30·082	76·
	10 ,,	E S E.	4 to 5	b. c.	30·074	71·5
	midnight	–	–	–	30·050	72·
14 ,,	6 a.m.	–	–	–	30·082	74·
	8 ,,	E.S.E.	8 to 6 to 7	c. v. q.	–	–
	noon	–	–	–	30·130	74·
	2 p.m.	Ey.	5 to 6 to 7	c. v. q.	–	–
	6 ,,	–	–	–	30·128	72·
	10 ,,	E.S.E.	5 to 6 to 7	c. v. q.	–	–
	midnight	–	–	–	30·152	71·
15 ,,	6 a.m.	E.S.E.	4 to 5	o. c. p.	30·218	74·5
	8 ,,	–	–	–	30·232	76·5
	2 p.m.	S.Ey.	4	o. c. p.	30·250	75·
	6 ,,	–	–	–	30·236	75·5
	10 ,,	S.Ey.	4	o. c. p.	30·254	73·
16 ,,	8 a.m.	E.S.E.	5	c. p. q.	30·194	73·
	2 p m	S.Ey.	5	c. p. q.	–	–
	10 ,,	E.S E.	2 to 4	c. p.	30·076	71·
17 ,,	4 a.m.	S.E.	3	c. v.	–	–
	noon	S.S.E.	3 to 4	c. p.	–	–
	2 p.m.	–	–	–	29·58	76·
	8 ,,	–	–	c. v.	–	–
	10 ,,	S.W.	3 to 4	c. v.	–	–
	midnight	–	–	–	25·83	72·
18 ,,	6 a.m.	W.N.W.	3 to 4	b. c.	29·88	75·
	8 ,,	–	–	–	29·894	76·5
	2 p.m.	W.N.W.	3	b. c.	–	–
	6 ,,	–	–	–	29·400	77·
	8 ,,	–	–	–	·972	73·
	10 ,,	W.	3	b. c.	·972	73·8
19 ,,	6 a.m.	W.	4	b. c. q.	29·954	73·
	2 p.m.	W.	4 to 6	b. c. q.	–	–
	4 ,,	–	–	–	29·518	74·
	8 ,,	–	–	–	29·526	74·
	10 ,,	W.	4 to 6	b. c. q.	30·00	74·
20 ,,	6 a.m.	S.	3	b. c.	29·956	73·
	2 p.m.	S.	1 to 2	c.	–	–
	4 ,,	S.	–	–	29·942	76·
	6 ,,	–	–	c. p.	–	–
	8 ,,	–	–	–	29·932	71·
	10 ,,	S.E.	3 to 4	c. p.*	–	–
21 ,,	4 a.m.	Variable	–	c. p.	–	–
	8 ,,	N.W.	3 to 4	b. c.	29·924	74·
	2 p.m.	Ny.	3	b. c.	–	–
	6 ,,	–	–	–	29·952	76·
	10 ,,	Ny.	1	b. c.	–	–
	midnight	–	–	–	29·954	71·
22 ,,	8 a.m.	Ny.	2 to 3	b. c.	–	–
	10 ,,	–	–	–	29·914	79·
	2 p.m.	Ny.	1 to 2	b. c.	–	–
	6 ,,	–	–	–	29·970	76·
	10 ,,	W.	1 to 2	b. c.	29·982	73·
23 May	6 a.m.	N.Wy.	3 to 6	c. p. q.	29·948	71·
	noon	Ny.	5 to 6 to 4	b. c. q.	–	–
	6 p.m.	–	–	–	30·13	72·5
	8 ,,	Ny.	4	b. c.	–	–
	midnight	–	–	–	30·162	68·
24 ,,	6 a.m.	–	–	–	30·222	68·5
	8 ,,	N.Ey.	2 to 3	b. c.	–	–
	2 p.m.	E.N.E.	2 to 3	b. c.	–	–
	4 ,,	–	–	–	30·224	74·
	8 ,,	N.Ey.	2 to 3	b. c.	30·212	68·5
	midnight	–	–	–	30·22	67·
25 ,,	6 a.m.	E.S.E.	3 to 4	b. c.	30·184	68·
	8 ,,	–	–	–	·234	75·
	2 p.m.	E.S.E.	4	c.	–	–
	6 ,,	–	–	–	30·192	73·5
	10 ,,	E.S.E.	4	c.	30·198	73·
	midnight	–	–	–	·193	74·
26 ,,	6 a.m.	S.	5 to 6	c. g. q. p.	30·142	72·
	2 p.m.	S.E.	5 to 6	c. g. q. v.	30·142	77·5
	8 ,,	S.E.	5 to 6	c. g. q. v.	–	–
	midnight	–	–	–	30·116	74·
27 ,,	6 a.m.	S.	5 to 6	b. c. q.	30·102	74·
	2 p.m.	S.W.	5	b. c. q.	–	–
	4 ,,	–	–	–	30·134	82·
	8 ,,	–	–	–	30·126	76·
	10 ,,	S.W.	5	c. q.	30·124	74·5
28 ,,	6 a.m.	S.S.W.	5 to 6	b. c. q.	30·050	76·5
	2 p.m.	S.S.W.	5 to 6	b. c. q.	–	–
	4 ,,	–	–	–	30·092	81·5
	10 ,,	S.S.W.	5 to 6	b. c. q.	–	–
29 ,,	6 a.m.	–	2	b. c.	–	–
	8 ,,	S.S.W.	3 to 4	b. c.	30·10	78·
	2 p.m.	–	–	–	30·128	84·
	4 ,,	S.S.W.	3	b. c.	30·112	84·
	8 ,,	–	–	–	30·098	76·
	10 ,,	S.W.	3	b. c.	30·098	76·
30 ,,	6 a.m.	–	–	c. v.	30·114	75·
	8 ,,	S.S.W.	3 to 4	–	30·162	75½·
	10 ,,	–	–	c.	30·186	79·
	2 p.m.	S.S.W.	3	b. c.	–	–
	6 ,,	–	–	–	30·196	76·
	10 ,,	S.W.	3	b. c.	30·212	74·
31 ,,	6 a.m.	S.	2	b. c.	30·24	75·
	noon	–	–	–	30·272	74·
	2 p.m.	S.E.	1 to 2	b. c.	–	
	10 ,,	S.E.	1 to 2	b. c.	–	

J U N E.

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
1 June	6 a.m.	S.	1	b. c.	30·234	74·
	noon	S.E.	1	b. c.	–	–
	8 p.m.	S.E.	1 to 2	b. c.	–	–
2 ,,	6 a.m.	Sy.	2	b. c.	30·202	75·
	8 ,,	–	–	–	30·242	78·
	2 p.m.	S.W.	2 to 3	b. c.	–	–
	4 ,,	–	–	–	30·248	78·
	10 ,,	S.W.	1 to 2	b. c.	30·264	75·
3 ,,	6 a.m.	S.S.E.	3 to 4	b. c.	30·248	74½·
	2 p.m.	S.	3 to 4	b. c.	–	–
	4 ,,	–	–	–	30·262	83·
	6 ,,	–	–	–	·244	79·
	10 ,,	Sy.	3 to 4	b. c.	30·242	77·
4 ,,	6 a.m.	Sy.	3	b. c.	30·222	76½·
	noon	–	–	–	30·258	80·
	2 p.m.	Sy.	2	b. c.	–	–
	10 ,,	Sy.	1 to 2	b. c.	–	–
	midnight	–	–	–	30·260	77·
5 ,,	6 a.m.	–	–	–	30·202	80·
	8 ,,	Sy.	3	b. c.	–	–
	4 p.m.	Sy.	3	b. c.	30·312	81·
	10 ,,	Sy.	2 to 3	b. c.	–	–

METEOROLOGICAL NOTES abstracted from the Log kept by Captain *Pullen*, R.N., &c.—*continued.*

JUNE—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
6 June	8 a.m.	S.S.E. -	3 -	b. c. -	–	–
	noon -	–	–	–	30·328	78·
	2 p.m.	S.S.W. -	3 to 4 -	b. c. -	–	–
	10 „	Sy. -	3 -	b. c. -	–	–
7 „	8 a.m.	S.S.E. -	3 to 4 -	b. c. -	–	–
	2 p.m.	S. - -	3 to 4 -	b. c. -	–	–
	10 „	Sy. -	3 -	b. c. -	–	–
8 „	8 a.m.	S.W.	3 to 4 -	b. c. -	–	–
	2 p.m.	W. -	3 to 4 -	b. c. -	–	–
	10 „	W. -	3 to 4 -	b. c. -	–	–
9 „	6 a.m.	W. -	4 to 5 -	b. c. q.	30·214	77·
	noon -	W. -	4 to 5 -	b. c. q.	30·194	82·
	8 p.m.	W. -	4 to 5 -	b. c. q.	30·142	77·
10 „	6 a.m.	–	–	–	30·106	77·
	8 „	S.W. -	5 -	b. c. q.	–	–
	2 p.m.	S.W. -	5 -	b. c. q.	–	–
	6 „	–	–	–	30·130	79½·
	10 „	S.W. -	5 -	b. c. q.	–	–
	midnight	–	–	–	30·134	78·
11 „	6 a.m.	–	–	–	30·134	78·
	8 „	Sy. -	5 to 6 -	c. g. q.	·154	79·
	2 p.m.	Sy. -	5 to 6 -	c. g. q.	30·194	81½·
	10 „	S.S.W. -	5 to 6 -	c. g. q.	–	–
	midnight	–	–	–	30·198	78·
12 „	4 a.m.	Sy. -	3 to 4 -	b. c. -	–	–
	6 „	–	–	–	30·312	78·5
	2 p.m.	S.S.W. -	4 -	b. c. -	30·230	80·
	10 „	Sy. -	4 -	b. c. -	30·228	78·
13 „	6 a.m.	–	–	–	30·204	80·
	8 „	S.W. -	4 to 5 -	b. c. q.	30·222	79½·
	4 p.m.	S. - -	4 to 5 -	b. c. q.	30·192	82·
	10 „	Sy. -	4 to 5 -	b. c. q.	–	–
	midnight	–	–	–	30·162	79·
14 „	6 a.m.	S.W. -	4 to 5 -	b. c. -	30·148	78½·
	8 „	–	–	–	30·148	80·
	2 p.m.	S.W. -	4 -	b. c. -	30·196	79·
	10 „	S.W. -	4 -	b. c. -	–	–
15 „	8 a.m.	W.S.W. -	4 -	b. c. -	30·196	79½·
	2 p.m.	–	–	–	30·214	82½·
	4 „	W.S.W. -	4 -	b. c. -	–	–
	10 „	W.S.W. -	4 -	b. c. -	30·196	79·
16 „	6 a.m.	–	–	–	30·168	79·
	8 „	W. -	4 to 5 -	b. c. -	30·184	81½·
	2 p.m.	W. -	4 to 5 -	b. c. -	–	–
	8 „	W. -	4 to 5 -	b. c. -	–	–
17 „	6 a.m.	–	–	–	30·068	77·
	8 „	N.W. -	3 -	b. c. -	–	–
	4 p.m.	N.Wy. -	3 -	b. c. -	–	–
	10 „	N.W. -	3 -	b. c. -	29·944	74·
18 „	6 a.m.	–	–	–	29·902	75·
	8 „	N.W. -	4 to 5 -	b. c. -	29·924	79½·
	4 p.m.	N.W. -	4 -	b. c. -	29·916	78·5
	8 „	–	–	–	29·934	74½·
	10 „	N.W. -	4 -	b. c. -	–	–
19 „	6 a.m	–	–	–	29·936	75·
	8 „	N.W. -	3 -	b. c. -	·914	79½·
	4 p.m.	N.W. -	3 -	b. c. -	29·916	78·5
	6 „	–	–	–	29·934	74½·
	10 „	N.W. -	3 -	b. c. -	29·212	78·
20 „	6 a.m.	W. -	2 -	b. c. -	29·994	78·
	2 p.m.	W. -	2 to 3 -	b. c. -	–	–
	10 „	W. -	2 to 3 -	b. c. -	30·046	78·
	midnight	–	–	–	30·074	76·
21 „	6 a.m.	–	–	–	30·084	76·
	8 „	W. -	3 -	b. c. -	30·104	78·5
	2 p.m.	W. -	3 -	b. c. -	30·112	80·
	10 „	W. -	3 -	b. c. -	–	–
	midnight	–	–	–	30·100	76.

JUNE—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
22 June	6 a.m.	–	–	–	–	–
	8 „	W.N.W. -	2 -	b. c. -	–	–
	4 p.m.	W.N.W. -	2 -	b. c. -	30·140	78½·
	10 „	W.N.W. -	1 to 2 -	b. c. -	–	–
	midnight	–	–	–	30·132	74·
23 „	6 a.m.	–	–	–	30·134	73·
	8 „	W.N.W. -	2 to 3 -	b. c. -	–	–
	2 p.m.	W.N.W. -	2 to 3 -	b. c. -	–	–
	4 „	–	–	–	30·162	77·
	8 „	W.N.W. -	2 to 3 -	b. c. -	–	–
	10 „	–	–	–	30·186	73·
24 „	6 a.m.	W. -	3 -	b. c. -	30·172	72·
	noon -	–	–	–	30·244	76½·
	2 p.m.	W.N.W. -	3 -	b. c. -	–	–
	4 „	–	– -	–	30·246	78½·
	10 „	W.N.W. -	3 -	b. c. -	30·244	74·
25 „	6 a.m.	–	–	–	30·248	76·
	8 „	N.W. -	3 -	b. c. -	30·274	77½·
	4 p.m.	N.W. -	3 -	b. c. -	30·288	80½·
	10 „	N.W. -	3 -	b. c. -	–	–
	midnight	–	–	–	30·364	76·
26 „	8 a.m.	S.W. -	2 to 3 -	b. c. -	30·272	77½·
	10 „	–	–	–	30·276	80·
	2 p.m.	–	–	–	30·260	83½·
	4 „	S.W. -	2 to 3 -	b. c. -	30·238	82·
	8 „	–	–	–	30·218	79·
	10 „	S.W. -	2 to 3 -	b. c. -	–	–
27 „	6 a.m.	–	–	–	30·178	79·
	8 „	S.W. -	3 -	b. c. -	–	–
	4 p.m.	S.W. -	3 to 4 -	b. c. -	–	–
	6 „	–	4 -	–	30·174	82·
	10 „	S.W. -	4 -	b. c. -	30·182	79·
28 „	6 a.m.	–	–	–	30·156	80·
	8 „	S.W. -	4 -	b. c. -	–	–
	2 p.m.	S.W. -	4 to 5 -	b. c. q.	30·164	83½.
	10 „	S.Wy. -	4 -	b. c. p. s.	30·096	79·
29 „	4 a.m.	–	–	c. v. t. -	–	–
	8 „	N.W. -	4 -	c. p. -	30·022	78·
	10 „	–	–	–	30·048	77·
	2 p.m.	Ny. -	4 to 5 -	c. q. -	–	–
	8 „	–	–	–	30·856	76·
	10 „	Ny. -	4 to 5 -	c. q. -	–	–
30 „	6 a.m.	Ny. -	1 to 2 -	b. c. -	30·136	74·
	2 p.m.	Ny. -	1 -	b. c. -	–	–
	4 „	–	–	–	30·222	81½·
	10 „	N. - -	½ -	b. c. -	–	–
	midnight	–	–	–	30·244	74·

JULY.

Day.	Hour.	Direction.	Force.	Weather.	Bar.	Therm.
1 July	6 a.m.	Ny. -	1 to 2 -	b. c. -	30·28	76·
	2 p.m.	Ny. -	1 to 2 -	b. c. -	–	–
	4 „	–	–	–	30·262	76½·
	10 „	Ny. -	1 to 2 -	b. c. -	–	–
	midnight	–	–	–	30·254	76½·
2 „	6 a.m.	–	–	–	30·198	72·
	8 „	Ny. -	1 to 2 -	b. c. -	–	–
	10 „	–	–	–	30·232	79·
	2 p.m.	–	–	–	30·172	81½·
	4 „	Ny. -	1 -	b. c. -	30·166	79·
	10 „	Calm -	0 -	b. c. -	–	–
	midnight	–	–	–	30·122	76·
3 „	7 a.m.	–	–	–	30·054	79·
	8 „	W. -	3 -	b. c. -	–	–
	9 „	–	–	–	30·072	81½·
	1 p.m.	–	–	–	30·576	81½·
	4 „	W. -	2 to 3 -	b. c. -	–	–
	6 „	–	–	–	30·042	72·
	10 „	W.N.W.	2 -	b. c. -	–	–
4 „	6 a.m.	S.W. -	3 to 4 -	b. c. -	30·046	78·
	9 „	–	–	–	30·084	82·
	2 p.m.	S.W. -	4 to 5 -	b. c. -	30·102	84·
	6 „	–	–	–	30·098	85·
	10 „	S.W. -	4 to 5 -	b. c. -	–	–
	midnight	–	–	–	30·112	80·

METEOROLOGICAL Notes abstracted from the Log kept by Captain *Pullen*, R. N., &c.—*continued.*

JULY—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
5 July	7 a.m.	–	–	–	30·100	72·
	8 „	S.W.	5	b. c.	–	–
	1 p.m.	–	–	–	30·112	81·
	2 „	S.W.	4 to 5	o. c. v.	–	–
	4 „	–	–	–	30·110	81·
	10 „	S.W.	4 to 5	o. c. p.	–	–
	midnight	S.W.	2	c.	30·132	77·
6 „	6 a.m.	N.E.	1 to 2	b. c.	30·154	79·
	noon	–	–	–	30·198	81½·
	2 p.m.	N.Ey.	1 to 2	b. c.	–	–
	4 „	–	–	–	30·172	83½·
	8 „	Calm	–	b. c.	–	–
	10 „	N.	–	–	–	–
	midnight	–	–	–	30·172	77·
7 „	6 a.m.	–	–	–	30·760	77½·
	8 „	W.	1	b. c.	–	–
	2 p.m.	W.	–	b. c.	30·214	82·
	6 „	–	–	–	30·188	82½·
	10 „	W.	1	b. c.	–	–
	midnight	–	–	–	30·168	77½·
8 „	8 a.m.	W.	3	b. c.	30·192	81½·
	3 p.m.	–	–	–	30·212	80·
	4 „	W.	3	b. c.	–	–
	6 „	–	–	–	30·192	83½·
	10 „	W.	3	b. c.	30·192	80·5
	midnight	–	–	–	30·194	81·
9 „	8 a.m.	W.	3	b. c.	30·186	83·
	10 „	–	–	–	30·194	82·
	4 p.m.	W.N.W.	3	b. c.	30·150	83½·
	10 „	W.N.W.	3 to 4	b. c. l.	–	–
	midnight	–	–	–	30·142	79·
10 „	6 a.m.	N.	3	b. c. l.	30·184	77·
	10 „	–	–	–	30·212	79·
	2 p.m.	N.E.	3 to 4	b. c.	30·204	79·
	10 „	N.E.	3 to 4	b. c.	30·208	74½·
11 „	6 a.m.	–	–	–	30·192	76·
	8 „	E.	4	b. c.	–	–
	2 p.m.	E.	3 to 4	b. c.	–	–
	6 „	–	–	–	30·200	78·
	10 „	E.	3	b. c.	–	–
	midnight	–	–	–	30·182	75½·
12 „	6 a.m.	–	–	–	30·204	75·
	8 „	E.	3	b. c.	30·232	80·
	4 p.m.	E.	3	b. c.	–	–
	8 „	–	–	–	30·252	80½·
	10 „	E.S.E.	3	b. c.	–	–
13 „	4 a.m.	S.E.	4	c. p.	–	–
	6 „	–	–	–	30·270	82·
	8 „	S.	4	b. c.	–	–
	4 p.m.	S.S.E.	4	b. c.	30·274	86.
	10 „	S.S.E.	3 to 4	b. c.	–	–
14 „	6 a.m.	S.	4	b. c.	–	–
	7 „	–	–	–	30·254	85·
	noon	–	–	–	30·244	84½·
	2 p.m.	S.	3 to 4	b. c.	–	–
	6 „	–	–	–	30·212	80½·
	10 „	S.S.E.	3	b. c.	–	–
	midnight	–	–	–	30·176	80·
15 „	2 a.m.	S.	–	–	30·176	80·
	6 „	W.	–	b. c.	–	–
	8 „	S.W.	3	–	–	–
	2 p.m.	–	–	–	30·218	87·
	4 „	S.W.	2 to 3	b. c.	–	–
	6 „	–	–	–	30·194	86·
	10 „	S.W.	3	b. c.	–	–
	midnight	–	–	–	30·162	80·
16 „	6 a.m.	–	–	–	30·146	83·
	8 „	W.S.W.	4	b. c.	–	–
	10 p.m.	–	–	–	30·172	87·
	4 „	S.W.	4	b. c.	–	–
	6 „	–	–	–	30·162	82·
	10 „	W.S.W.	4	b. c.	–	–
	midnight	–	–	–	30·182	80·
17 „	6 a.m.	–	–	–	30·22	84·
	8 „	W.	4	b. c.	–	–
	noon	–	–	–	30·274	87·
	2 p.m.	W.S.W.	4	b. c.	–	–
	6 „	–	–	–	30·198	85½·
	10 „	W.S.W.	4	b. c.	30·338	81·

JULY—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
18 July	6 a.m.	S.W.	3	b. c.	30·35	82·
	noon	S.S.W.	2 to 3	b. c.	–	–
	8 p.m.	S.S.W.	3	b. c.	–	–
19 „	6 a.m.	–	–	–	30·326	82·
	8 „	S.W.	2 to 3	b. c.	–	–
	2 p.m.	–	–	–	30·348	83½·
	4 „	S.W.	2 to 3	b. c.	–	–
	8 „	–	–	–	30·264	82½·
	10 „	S.W.	3	b. c.	–	–
	midnight	–	–	–	30·256	81·
20 „	6 a.m.	W.	4	c. p.	–	–
	7 „	–	–	–	30·214	81½·
	noon	W.S.W.	1 to 2 to 3	c. p.	–	–
	6 p.m.	–	–	–	30·182	80·
	8 „	S.S.W.	3 to 4	c.	–	–
21 „	6 a.m.	S.S.W.	4	b. c. p.	30·192	80·
	8 „	–	–	–	30·208	82½·
	noon	–	–	–	30·222	80·
	2 p.m.	S.S.W.	4	b. c. p.	–	–
	10 „	S.S.W.	4	b. c. p.	–	–
22 „	6 a.m.	S.W.	5	b. c. q. p.	30·186	80·
	8 „	–	–	–	30·198	83·
	2 p.m.	S.W.	5	b. c. q.	30·248	86·
	6 „	–	–	–	30·234	86·
	8 „	–	–	–	30·228	83·
	10 „	S.W.	5	b. c. q. p.	30·244	80·
23 „	8 a.m.	Sy.	5 to 6	b. c. q.	30·250	82·
	2 p.m.	–	–	–	30·296	88½·
	4 „	Sy.	6	b. c. q.	–	–
	10 „	Sy.	6	b. c. q.	30·310	81·
24 „	8 a.m.	Sy.	3	b. c.	30·357	84·
	10 „	–	–	–	30·376	86·
	2 p.m.	S.S.W.	3	b. c.	30·372	88·
	10 „	S.S.W.	3	b. c.	–	–
25 „	6 a.m.	–	–	–	30·342	80·
	8 „	Sy.	3 to 4	b. c.	–	–
	2 p.m.	S.S.E.	3	b. c.	–	–
	8 „	S.S.E.	3	b. c.	–	–
	midnight	–	–	–	30·386	80·
26 „	8 a.m.	S.	3	b. c.	–	–
	2 p.m.	S.S.W.	3	b. c.	–	–
	6 „	–	–	–	30·428	–
	10 „	S.S.W.	2 to 3	b. c.	–	–
27 „	6 a.m.	–	–	–	30·432	82·
	8 „	W.	2	b. c.	–	–
	4 p.m.	W.	1	b. c.	–	–
	8 „	–	–	–	30·396	81·
	10 „	Ny.	½	b. c.	–	–
	midnight	–	–	–	30·394	79·
28 „	6 a.m.	–	–	–	30·376	80½·
	8 „	W.	2 to 3	b. c.	30·386	82½·
	2 p.m.	W.	2 to 3	b. c.	30·362	86·
	10 „	W.	2	b. c.	–	–
	midnight	–	–	–	30·280	80·
29 „	6 a.m.	–	–	–	30·250	79·
	8 „	W.	4	b. c.	–	–
	4 p.m.	W.S.W.	4 to 5	b. c.	30·184	86½·
	10 „	S.W.	5	b. c.	–	–
	midnight	–	–	–	30·134	80·
30 „	4 a.m.	–	6	c. q. p.	–	–
	6 „	Sy.	4 to 3	c. p.	–	–
	7 „	–	–	–	30·148	79·
	2 p.m.	S.S.E.	4 to 5	c. q.	–	–
	4 „	–	–	–	30·150	81½·
	10 p.m.	Sy.	5	c. q.	–	–
31 „	4 a.m.	–	–	c. v.	–	–
	7 „	–	–	–	30·204	84·
	8 „	W.	5	c. p.	–	–
	11 „	–	–	–	30·244	80·
	3 p.m.	W.S.W.	5	c. q.	–	–
	6 „	–	–	–	30·228	83½·
	10 „	W.S.W.	5	c. q. l. t.	–	–

METEOROLOGICAL NOTES abstracted from the Log kept by Captain *Pullen*, R.N., &c.—*continued.*

AUGUST.

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
1 Aug.	2 a.m.	–	–	c. q. p. l. t.	–	–
	6 ”	W.S.W. -	4 to 5 -	c. q. p.	30·252	80·
	2 p.m.	W.S.W. -	4 -	c. p. -	–	–
	10 ”	W.S.W. -	3 to 4 -	b. c. -	30·276	79½·
2 ”	6 a.m.	–	b. c. -	b. c. -	30·218	79·
	7 ”	W. -	–	–	–	–
	2 p.m.	W.S.W. -	3 to 4 -	b. c. -	–	–
	6 ”	–	–	–	30·214	83½·
	10 ”	W. -	3 to 4 -	b. c. -	30·198	80·
3 ”	6 a.m.	–	–	–	30·164	80·
	8 ”	W. -	3 to 5 -	b. c. p. q.	30·172	81·
	2 p.m.	–	–	–	30·190	86·
	3 ”	W. –	3 to 5 -	b. c. p. q.	–	–
	6 ”	–	–	–	30·162	81·
	10 ”	W. –	3 to 5 -	b. c. p. q.	–	–
	midnight	–	–	–	30·158	80½.
4 ”	8 a.m.	S.W. -	3 to 4 -	b. c. -	30·184	–
	4 p.m.	S.W. -	3 to 4 -	b. c. -	–	–
	10 ”	S.W. -	4 -	b. c. -	–	–
5 ”	7 a.m.	–	–	–	30·252	83·
	8 ”	Sy. -	3 -	b. c. -	–	–
	4 p.m.	S. -	3 -	c. -	–	–
	8 ”	–	–	–	30·304	88·
	10 ”	Sy. -	2 to 3 -	c. -	–	–
6 ”	Sy.	–	–	–	30·350	84·
	8 p.m.	Sy. -	1 to 2 -	b. c. -	–	–
	4 ”	Sy. -	1 -	b. c. -	30·362	86·
	10 ”	Calm -	–	b. c. -	–	–
7 ”	4 a.m.	–	–	c. p. -	–	–
	8 ”	Sy. -	1 -	b. c. -	30·352	83·
	noon -	–	–	c. -	–	–
	2 p.m.	–	–	–	30·304	83½·
	4 ”	S.W. -	1 -	b. c. -	–	–
	6 ”	–	–	–	30·274	84·
	8 ”	–	–	c. -	–	–
	11 ”	S.W. -	1 -	–	30·234	81·
	midnight	–	–	c. -	–	–
8 ”	6 a.m.	Sy. -	3 -	c. p. -	30·198	81·
	2 p.m.	S.W. -	2 -	b. c. -	–	–
	6 ”	–	–	–	30·140	81½·
	10 ”	Calm -	–	b. c. -	–	–
	midnight	–	–	–	30·134	77½.
9 ”	4 a.m.	Vble. -	–	–	–	–
	6 ”	N. -	1 to 2 -	b. c. -	30·138	–
	2 p.m.	N.W. -	1 -	b. c. -	–	–
	10 ”	Calm -	–	b. c. -	–	–
	midnight	–	–	–	30·152	78.
10 ”	6 a.m.	–	–	–	30·186	77·
	8 ”	W. -	1 -	b. c. -	–	–
	noon -	–	–	–	30·222	82·
	4 p.m.	W. -	1 -	b. c. -	–	–
	8 ”	–	–	–	30·212	80·
	10 ”	Calm -	0 -	b. c. -	–	–
11 ”	6 a.m.	–	–	–	30·244	79·
	8 ”	W.S.W. -	2 to 3 -	b. c. -	–	–
	3 p.m.	S.W. -	3 -	b. c. -	–	–
	5 ”	–	–	–	30·222	85·
	8 ”	–	–	–	30·214	82·
12 ”	8 a.m.	W. -	3 -	b. c. -	30·222	84·
	2 p.m.	W. -	3 -	b. c. -	–	–
	3 ”	–	–	–	30·204	85½·
	8 ”	–	–	–	30·220	81·
	9 ”	W. -	3 -	b. c. -	–	–
	midnight	–	–	–	30·212	80·
13 ”	4 a.m.	W. -	5 -	–	–	–
	6 ”	–	–	b. c. q.	30·212	82·
	8 ”	W. -	4 to 5 -	–	–	–
	10 ”	–	–	–	30·222	84·
	2 p.m.	W. -	4 to 5 -	b. c. q.	–	–
	4 ”	–	–	–	30·2	84·
	10 ”	Calm -	–	b. c. -	30·184	79·
14 ”	6 a.m.	E. -	1 to 2 -	e. m. -	30·212	82·
	noon -	–	–	–	·22	84·
	2 p.m.	E. –	1 to 2 -	e. m. -	–	–
	6 ”	–	–	–	·2	84·
	10 ”	E. -	1 to 2 -	e. m. -	–	–
	midnight	–	–	–	·184	79·

AUGUST—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
15 Aug.	6 a.m.	Calm -	0 -	b. c. p. l. t.	30·172	80·
	10 ”	–	–	c. p. l. t.	–	–
	2 p.m.	W. -	0 to 1 -	–	·194	81·
	6 ”	N. -	1 -	b. c. p.	–	–
	8 ”	–	–	–	·192	80·
	10 ”	Vble. -	1 -	–	–	–
16 ”	6 a.m.	–	–	–	30·206	76·
	8 ”	S.E. -	1 -	b. c. -	–	–
	noon -	–	–	–	·22	80·
	2 p.m.	Vble. -	1 -	b. c. -	–	–
	6 ”	–	–	–	·250	85·
	9 ”	Ny. -	1 -	b. c. -	–	–
	midnight	Calm -	–	–	·23	79·
17 ”	6 a.m.	–	–	–	30·248	78·
	8 ”	W. -	2 -	b. c. -	–	–
	3 p.m.	W. -	2 -	b. c. -	–	–
	6 ”	–	–	–	30·238	85·
	9 ”	W. -	1 -	b. c. -	–	–
	midnight	Calm -	–	–	–	–
18 ”	6 a.m.	W. -	3 -	b. c. -	30·216	81·
	2 p.m.	W. -	2 -	b. c. -	–	–
	4 ”	–	–	–	30·226	85·
	10 ”	W. -	2 -	b. c. -	·224	80½·
19 ”	6 a.m.	–	–	–	30·22	83½·
	8 ”	N.W. -	3 -	b. c. -	–	–
	4 p.m.	N.W. -	3 -	b. c. p.	·200	84·
	10 ”	–	–	b. c. -	·204	80·
	midnight	N.W. -	3 -	–	–	–
20 ”	6 a.m.	–	–	–	30·208	83·
	8 ”	W.N.W. -	3 -	b. c. -	–	–
	4 p.m.	S.W. -	2 -	b. c. -	30·214	86½·
	9 ”	–	–	–	·188	82·
	midnight	S. -	1 to 2 -	b. c. l.	·188	80·
21 ”	8 a.m.	S.E. -	2 -	b. c. -	30·236	83·
	noon -	–	–	–	·246	84·
	2 p.m.	S.E. -	2 -	b. c. -	30·242	83·
	6 ”	–	–	–	·242	83·
	10 ”	–	–	b. c. l.	30·234	79·
22 ”	6 a.m.	–	–	–	30·25	79·
	8 ”	S.E. -	3 -	b. c. -	–	–
	3 p.m.	S.E. -	2 -	b. c. -	–	–
	4 ”	–	–	–	·27	85·
	10 ”	S.E. -	1 -	b. c. q.	·23	78½·
23 ”	6 a.m.	–	–	–	30·266	80·
	8 ”	E. - -	3 -	b. c. -	–	–
	4 p.m.	E. - -	2 to 3 -	b. c. -	·262	85·
	10 ”	E. - -	3 -	b. c. -	–	–
	midnight	–	–	–	·246	76·
24 ”	6 a.m.	–	–	–	30·232	77·
	8 ”	E. - -	3 -	b. c. -	–	–
	4 p.m.	E. - -	2 to 3 -	b. c. -	·234	87·
	8 ”	–	–	–	30·212	80·
	10 ”	E. - -	2 -	b. c. l.	·234	79.
25 ”	6 a.m.	–	–	–	30·20	79·
	8 ”	S.E. -	3 -	b. c. -	–	–
	4 p.m.	S.E. -	3 -	b. c. -	·198	80·
	10 ”	–	–	–	·194	82½·
	midnight	Sy. -	3 to 4 -	b. c. l. t.	–	–
26 ”	6 a.m.	–	–	–	30·172	84·
	8 ”	S.W. -	4 -	b. c. -	–	–
	4 p.m.	S.W. -	4 -	b. c. -	30·196	87·
	10 ”	S.W. -	4	b. c. p. l.	–	–
	midnight	–	–	–	·200	79·
27 ”	6 a.m.	–	–	–	30·204	83·
	8 ”	W.S.W. -	4 to 5 -	b. c. -	–	–
	4 p.m.	W.S.W. -	4 to 5 -	b. c. -	30·324	85·
	10 ”	S.W. -	4 -	b. c. -	–	–
	midnight	–	–	–	30·226	82·
28 ”	7 a.m.	–	–	–	30·218	83·
	8 ”	S.S.W. -	4 -	b. c. -	·224	84·
	noon -	–	–	–	·272	79·
	2 p.m.	S.W. -	4 -	b. c. -	–	–
	6 ”	–	–	–	·246	83·
	10 ”	S.W. –	4 -	b. c. -	·254	82·

METEOROLOGICAL NOTES Abstracted from the Log kept by Captain *Pullen*, R.N., &c.—*continued*.

AUGUST—*continued*.

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
29 Aug.	6 a.m.	S.	4	b. c.	30·212	82·
	2 p.m.	S.	4	b. c.	·280	87·
	4 „	–	–	–	·308	81·
	9 „	S.	4	b. c. l.	·240	76½·
30 „	6 a.m.	S.	4	b. c.	30·226	81½·
	noon	S.	3 to 4	b. c.	–	–
	6 p.m.	–	–	–	30·236	83½·
	8 „	S.	3 to 4	c. l. t.	–	–
31 „	6 a.m.	–	–	–	30·02	82½·
	8 „	S.	3	b. c.	–	–
	10 a.m.	–	–	–	30·234	87·
	4 p.m.	S.	3	b. c.	–	–
	6 „	–	–	c. p.	–	–
	10 „	S.	4	b. c. l, t.	–	–

SEPTEMBER.

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
1 Sept.	8 a.m.	S.	4	b. c. q.	–	–
	3 p.m.	S.	2 to 4	c. p. l. t.	–	–
	6 „	N.W.	3	c. p. l. t.	–	–
	10 „	N.W.	2 to 4	c. p. l. t.	–	–
2 „	8 a.m.	S.	3	b. c.	–	–
	4 p.m.	S.W.	3	c.	–	–
	10 „	W.	4 to 5	c. v. l. t.	–	–
3 „	8 a.m.	S.W.	3	b. c. p.	–	–
	3 p.m.	S.W.	2 to 3	b. c. p.	–	–
	9 „	S.W.	3	c.	–	–
	midnight	Calm	–	c.	–	–
4 „	8 a.m.	N.W.	2 to 3	b. c.	–	–
	4 p.m.	N.W.	2 to 3	b. c.	–	–
	10 „	N.W.	1 to 2	b. c.	–	–
5 „	6 a.m.	W.	1	b. c.	–	–
	10 „	Calm	–	b. c.	–	–
	4 p.m.	W.	1 to 2	b. c.	–	–
	10 „	W.	1 to 2	b. c.	–	–
6 „	6 a.m.	S.W.	1	b. c.	–	–
	4 p.m.	S.W.	1 to 2	b. c.	–	–
	10 „	S.W.	1 to 2	b. c. p.	–	–
7 „	8 a.m.	S.W.	2	b. c.	–	–
	4 p.m.	S.W.	2	b. c.	–	–
	10 „	S.W.	2	b. c. p.	–	–
8 „	4 a.m.	W.	3	b. c.	–	–
	8 „	N.W.	5	b. c. q.		–
	2 p.m.	N.W.	5 to 6	b. c. q.	–	–
	10 „	N.W.	5 to 4	b. c. q.	–	–
9 „	6 a.m.	N.	2	b. c.	–	–
	2 p.m.	N.E.	1 to 2	b. c.	–	–
	9 „	N.E.	1	b. c.	–	–
10 „	7 a.m.	Calm	–	b. c.	–	–
	3 p.m.	S.W.	1 to 2	b. c.	–	–
	11 „	S.W.	1	b. c.	–	–
11 „	8 a.m.	S.W.	3	b. c.	30·084	80·½
	2 p.m.	–	–	–	30·072	81·½
	4 „	W.S.W.	2 to 3	b. c.	–	89·
	10 „	S.W.	2	p. c.	–	–
12 „	3 a.m.	–	–	c. p.	–	–
	8 „	W.S.W.	3 to 4	b. c.	29·942	80·
	2 p.m.	–	–	–	876	84·
	4 „	S.W.	3	b. c.	–	–
	6 „	–	–	–	864	81·
	10 „	S.W.	3	b. c.	–	–
13 „	8 a.m.	W.	3	c. v.	29·894	82·
	10 „	–	–	–	932	81·
	2 p.m.	W.	3	c. p.	966	79½·
	6 „	–	–		30·02	78·
	10 „	W.	3	c.	30·088	76·

SEPTEMBER—*continued*.

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
14 Sept.	6 a.m.	–	–	–	30·110	77·
	8 „	W.	4	b. c.	–	–
	10 „	–	–	–	·148	80·
	4 p.m.	W.	4	b. c.	–	–
	6 „	–	–	–	30·182	77·
	10 „	W.	3 to 4	b. c.	30·223	75·
15 „	6 a.m.	E.	2	b. c.	30·224	75½·
	10 „	–	–	–	·248	77·
	2 p.m.	E.	2	b. c.	30·226	79·
	10 „	E.	2	b. c.	30·220	73·
16 „	7 a.m.	N.W.	3	b. c.	30·138	–
	11 „	–	–	–	·162	80·
	2 p.m.	W.	3	b. c.	·124	80·
	5 „	–	–	–	30·100	80·5
	10 „	W.S.W.	3	b. c.	30·104	77·
17 „	7 a.m.	–	–	–	30·092	78·5
	2 p.m.	–	–	–	·118	83·
	7 „	–	–	–	·154	78·5
	11 „	–	–	–	·166	77·5
18 „	8 a.m.	–	–	–	30·228	78·5
	1 p.m.	–	–	–	·256	83·
	4 „	–	–	–	·260	82·5
	9 „	–	–	–	·272	78·5
19 „	7 a.m.	–	–	–	30·286	81·5
	noon	–	–	–	·283	83·5
	5 p.m.	–	–	–	·250	83·5
	midnight	–	–	–	·266	80·
20 „	7 a.m.	–	–	–	30·286	81·5
	9 „	–	–	–	·304	83·
	noon	–	–	–	·300	86·
	2·30 p.m.	–	–	–	·272	87·
	10 „	–	–	–	·250	82·
21 „	7 a.m.	–	–	–	30·264	80·
	1·30 p.m.	–	–	–	·252	83·
	10 „	–	–	–	·238	78·5
22 „	7 a.m.	–	–	–	30·226	79·
	noon	–	–	–	·238	82·5
	3 p.m.	–	–	–	·212	82·5
	10 „	–	–	–	·165	79·5
23 „	7 a.m.	–	–	–	30·144	80·
	1 p.m.	–	–	–	·104	83·5
	7 „	–	–	–	·072	78·5
	10 „	–	–	–	·070	79·
24 „	7 a.m.	–	–	–	30·076	79·
	2·30 p.m.	–	–	–	·092	85·
	5 „	–	–	–	·072	83·
	10 „	–	–	–	·088	78·
25 „	7 a.m.	–	–	–	30·076	78·5
	10·30 „	–	–	–	·064	83·
	3 p.m.	–	–	–	·000	83·
	9 „	–	–	–	·004	80·
	11 „	–	–	–	·042	79·
26 „	7 a.m.	–	–	–	30·126	76·
	2·30 p.m.	–	–	–	·052	75·5
	midnight	–	–	–	·202	74·5
27 „	7 a.m.	–	–	–	30·254	75·
	1·30 p.m.	–	–	–	·284	78·5
28 „	7 a.m.	–	–	–	30·332	73·
	noon	–	–	–	·372	79·
	9 p.m.	–	–	–	·354	75·
29 „	7 a.m.	–	–	–	30·334	76·5
	10·30 „	–	–	–	·502	80·
	2·30 p.m.	–	–	–	·308	81·
	7 „	–	–	–	·274	78·
30 „	7 a.m.	–	–	–	30·232	79·

Meteorological Notes, abstracted from the Log kept by Captain *Pullen*, R.N., &c.—*continued.*

OCTOBER.

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
2 Oct.	10 a.m.	–	–	–	30·270	79·
	1·30 p.m.	–	–	–	·250	80·
	4·10 ,,	–	–	–	·260	79·
3 ,,	7 a.m.	–	–	–	30·202	79·
	noon -	–	–	–	·212	82·5
	5·30 p.m.	–	–	–	·168	79·
4 ,,	8 a.m.	–	–	–	30·184	79·
	noon -	–	–	–	·172	80·
	4 p.m.	–	–	–	·118	81·
	10 ,,	–	–	–	·100	77·
5 ,,	7 a.m.	–	–	–	30·444	77·5
	10 ,,	–	–	–	·082	81·
	1 p.m.	–	–	–	·046	83·
	4 ,,	–	–	–	·014	79·5
	10 ,,	–	–	–	·032	76·
6 ,,	7 a.m.	–	–	–	30·034	75·
	2 p.m.	–	–	–	·038	77·5
	7 ,,	–	–	–	·050	73·
	10 ,,	–	–	–	·070	73·
7 ,,	7 a.m.	–	–	–	30·062	73·
	noon -	–	–	–	·070	81·
	4·30 p.m.	–	–	–	·046	78·5
	10 ,,	–	–	–	·028	73·5
8 ,,	7 a.m.	–	–	–	29·978	73·5
	1 p.m.	–	–	–	·928	81·
	6 ,,	–	–	–	·884	76·
	10 ,,	–	–	–	·860	75·
9 ,,	8 a.m.	–	–	–	29·012	78·
	10·30 ,,	–	–	–	·816	72·
	1 p.m.	–	–	–	·804	83·
	6 ,,	–	–	–	·816	77·
	11 ,,	–	–	–	·956	76·
10 ,,	7·30 a.m.	–	–	–	30·046	73·5
	10 ,,	–	–	–	·084	77·
	noon -	–	–	–	·074	77·
	4·30 p.m.	–	–	–	·046	76·
	8 ,,	–	–	–	·016	73·
	10 ,,	–	–	–	·024	73·5
11 ,,	8 a.m.	–	–	–	29·986	76·
	noon -	–	–	–	·986	78·5
	2·30 p.m.	–	–	–	·950	89·
	11 ,,	–	–	–	·960	74·
12 ,,	7 a.m.	–	–	–	29·932	75·
	1·30 p.m.	–	–	–	·914	77·5
	4 ,,	–	–	–	·918	78·5
	7 ,,	–	–	–	·886	73·
	11 ,,	–	–	–	·926	72·
13 ,,	8 a.m.	–	–	–	29·896	76·
	2·30 p.m.	–	–	–	·864	80·5
	10·30 ,,	–	–	–	·864	75·
14 ,,	7 a.m.	N.W. -	5 -	b. c. q.	29·818	74·
	noon -	–	–	–	·896	76·5
	4 p.m.	N.W. -	5 -	b. c. q.	·918	74·5
	10·30 ,,	–	–	–	·976	71·
15 ,,	8 a.m.	W. -	2 -	b. c. -	30·046	76·
	3 p.m.	W. -	2 -	b. c. -	·050	79·5
	10 ,,	W. -	2 -	b. c. -	·068	72·5
16 ,,	6 a.m.	–	–	–	30·984	74·
	8 ,,	W. -	2 -	b. c. -	—	—
	10 ,,	–	–	–	·094	79·
	2 p.m.	W. -	2 -	b. c. -	·078	81·
	6 ,,	–	–	–	·042	76·
	8 ,,	W.S.W. -	3 -	b. c. -	—	—
	10 ,,	–	–	–	·050	76·

OCTOBER—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
17 Oct.	6 a.m.	S.W. -	3 -	b. c. -	30·094	75·
	1·30 p.m.	–	–	–	·082	80½·
	2 ,,	S. -	3 -	b. c. -	—	—
	8 ,,	S. -	3 -	b. c. .	·086	78·
	10 ,,	–	–	–	—	—
18 ,,	8 a.m.	S. -	2 -	b. c. -	30·148	75·
	4 p.m.	S.E. -	2 -	b. c. -	·02	76·
	10 ,,	S.E. -	2 -	b. c. -	·928	75·
19 ,,	7 a.m.	Sy. -	5 to 6	c. q. p.	29·76	75½·
	10 ,,	–	–	–	·720	78½·
	noon -	–	–	–	·650	77·
	1 p.m.	–	–	–	·586	—
	2 ,,	Sy. -	5 to 6	c. q. p.	·592	78½·
	4 ,,	–	–	–	·674	78½·
	10 ,,	S. -	3 to 4	c. q. p.	·822	75·
20 ,,	7 a.m.	–	–	–	29·950	74·
	8 ,,	S. -	3 -	b. c. -	–	—
	3 p.m.	S. -	2 -	b. c. -	·974	77·
	10 ,,	S. -	2 -	b. c. -	·044	72½·
21 ,,	6 a.m.	W.N.W. -	2 -	b. c. -	30·048	72·
	1 p.m.	W.N.W. -	2 -	b. c. -	·092	76·
	8 ,,	N.W. -	2 to 3	b. c. -	—	—
22 ,,	7 a.m.	S.W. -	2 -	b. c. -	20.084	70·
	noon -	–	–	–	·046	77·
	2 p.m.	S. -	2 -	b. c. -	—	—
	4 ,,	–	–	–	29·950	76·
	9 ,,	S.W. -	3 -	b. c. -	·792	75·
23 ,,	7 a.m.	S. -	2 -	c. p. -	29·63	72·
	noon -	–	–	–	·682	75·
	2 p.m.	S.W. -	2 -	c. p. -	29·69	72·
	10 ,,	S.W. -	2 -	c. -	·854	69·
24 ,,	8 a.m.	W. -	1 -	c. -	30·622	71.
	4 p.m.	S. -	1 -	b. c. -	·020	70½·
	10 ,,	S.E. -	2 -	b. c. -	29·932	71·
25 ,,	6 a.m.	W. -	1 -	b. c. p.	29·774	72·
	9 ,,	Calm -	0 -	b. c. p.	—	—
	noon -	–	–	–	·752	76·
	2 p.m.	–	–	–	·728	75·
	4 ,,	W. -	1 -	b. c. -	·710	74½·
	10 ,,	S.W. -	2 to 3	c. p. -	·678	72·
26 ,,	6 a.m.	–	–	–	29·66	71½·
	8 ,,	W. -	6 -	b. c. p. q.	—	—
	noon -	W.S.W. -	6 -	b. c. p. q.	—	—
	2 p.m.	W.S.W. -	6 -	b. c. p. q.	·746	75·
	10 ,,	W.S.W. -	4 -	b. c. p. q.	·944	69½·
27 ,,	8 a.m.	N.W. -	1 to 2	b. c. g.	30·138	70½·
	2 p.m.	N.W. -	1 to 2	b. c. g.	·166	74·
	6 ,,	–	–	–	·150	72½·
	10 ,,	N.W. -	–	b. c. g.	—	—
28 ,,	6 a.m.	S.S.W. -	4 to 5	c. g. -	30·134	70½·
	2 p.m.	Sy. -	4 -	c. -	·072	77·
	10 ,,	Sy. -	5 to 6	c. g. -	·634	75·
29 ,,	6 a.m.	–	–	–	29·98	76·
	8 ,,	Sy. -	2 to 3	c. q. v.	—	—
	noon -	–	–	–	30·036	77·
	6 p.m.	Sy. -	2 to 3	b. c. -	·024	78·
	10 ,,	Sy. -	3 to 4	c. -	—	—
30 ,,	8 a.m.	W. -	3 -	b. c. -	30·13	72½·
	2 p.m.	W. -	3 -	b. c. -	·100	75·
	8 ,,	W.N.W.	3 to 4	b. c. -	·102	69½·
31 ,,	8 a.m.	N.W. -	3 -	b. c. g.	30·126	70½·
	2 p.m.	N.W. -	2 to 3	c. -	—	—
	4 ,,	–	–	–	·140	72·
	10 ,,	N.W. -	1 to 2	c. -	·142	69½·

METEOROLOGICAL NOTES abstracted from the Log kept by Captain *Pullen*, R.N., &c.—*continued.*

NOVEMBER.

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
1 Nov.	6 a.m.	–	–	–	30·118	69·
	8 „	W.	5	b. c. q.	–	–
	2 p.m.	W.	5	b. c. q.	·132	71½
	6 „	–	–	–	·116	70½
	8 „	W.	5	b. c. q.	–	–
	midnight	–	–	–	·150	70·
2 „	6 a.m.	W.S.W.	5 b.	b. c. q. p.	–	–
	8 „	–	–	–	30·168	69.
	2 p.m.	W.	5	b. c. q. p.	·192	79½
	10 „	W.	4	b. c. p.	·174	66·
3 „	8 a.m.	S.S.E.	3 to 4	g. c. p.	30·136	66·
	2 p.m.	S.S.E.	4 to 5	g. c. v.	29·924	69½
	8 „	S.	4 to 6	c. v.	–	–
	10 „	–	–	–	·912	62·
4 „	6 a.m.	–	–	–	30·00	71½
	8 „	S.S.E.	3	b. c.	–	–
	2 p.m.	–	–	–	29·98	78½
	6 „	S.W.	–	–	–	–
	10 „	S.	3 to 4	c.	·998	66·
5 „	8 a.m.	S.	4 to 5	c. q. p.	29·95	69·
	4 p.m.	S.W.	4 to 5	c. q. p.	29.66	76·
	10 „	S.E.	4	c.	30·108	61·
6 „	8 a.m.	S.S.E.	2	b. c.	30·278	69·
	2 p.m.	S.	2	b. c.	·338	71·
	10 „	S.S.E.	2	b. c.	·404	67·
7 „	8 a.m.	E.N.E.	3	b. c.	30·450	67·
	4 p.m.	E.N.E.	3	c. p.	·452	68·
	10 „	E.N.E.	3	c. b.	–	–
	midnight	–	–	–	·448	68½
8 „	8 a.m.	E.	4	b. c.	30·44	69·
	2 p.m.	E.	4	b. c.	·432	74.
	10 „	E.S.E.	4	b. c.	–	–
9 „	8 a.m.	S.E.	4	b. c.	–	–
	2 p.m.	S.E.	4	b. c.	–	–
	10 „	E.S.E.	3	b. c.	–	–
10 „	8 a.m.	S.E.	4	b. c.	–	–
	2 p.m.	S.E.	3 to 4	b. c.	–	–
	10 „	S.E.	3 to 4	b. c.	–	–
11 „	8 a.m.	S.	5 to 6	b. c. q.	–	–
	2 p.m.	S.	5 to 6	b. c. q.	–	–
	8 „	Sy.	5	b. c. q.	–	–
12 „	8 a.m.	S.	5 to 6	b. c. q.	–	–
	2 p.m.	S.	5 to 6	b. c. q.	–	–
	8 „	Sy.	5	b. c. q.	–	–
13 „	8 a.m.	S.W.	2	b. c.	–	–
	noon	–	–	p. c.	–	–
	2 p.m.	S.W.	2	p. c.	–	–
	6 „	–	–	p. c.	–	–
	8 „	Ny.	3 to 4	–	–	–
	10 „	–	–	b. c.	–	–
14 „	8 a.m.	W.	4 to 5	b. c. q.	–	–
	2 p.m.	W.	5	b. c. q.	–	–
	10 „	W.	4	b. c. q.	–	–
15 „	6 a.m.	N.E.	2	b. c.	–	–
	2 p.m.	N.E.	1 to 2	b. c.	–	–
	10 „	N.E.	1 to 2	b. c.	–	–
16 „	8 a.m.	N.E.	2	b. c.	–	–
	6 p.m.	N.E.	2	b. c.	–	–
17 „	8 a.m.	N.E.	2	b. c.	–	–
	4 p.m.	N.E.	2	b. c.	–	–
	10 „	N.E.	2	b. c.	–	–
18 „	8 a.m.	E.	4 to 5	b. c.	–	–
	2 p.m.	E.	4 to 5	b. c.	–	–
	10 „	E.S.E.	4 to 5	b. c.	–	–
19 „	8 a.m.	S.E.	1	b. c.	–	–
	2 p.m.	Variable	1	b. c.	–	–
	8 „	Calm	0	b. c.	–	–

NOVEMBER—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
20 Nov.	8 a.m.	S.	2 to 3	b. c.	–	–
	4 p.m.	S.	2	b. c.	–	–
	9 „	S.	3 to 4	c. p.	–	–
21 „	8 a.m.	S.	3	b. c.	–	–
	2 p.m.	S.	2	b. c.	–	–
	10 „	S.	3	b. c.	–	–
22 „	2 a.m.	S.	4	b. c. p.	–	–
	10 „	S.	4	b. c.	–	–
	6 p.m.	S.W.	4 to 6	–	–	–
	7 „	–	–	b. x. p. q.	–	–
23 „	6 a.m.	S.	4	b. c.	–	–
	noon	W.	4 to 5	b. c. p. q.	–	–
	6 p.m.	W.	4 to 5	b. c. p. q.	–	–
	midnight	N.	4 to 5	b. c. p. q.	–	–
24 „	6 a.m.	N.	4 to 6	c. p. q.	–	–
	noon	N.	4 to 6	v.	–	–
	6 p.m.	–	–	–	–	–
	midnight	–	–	c. p. q.	–	–
25 „	6 a.m.	N.E.	6	c. p. q.	–	–
	noon	N.E.	6	b. c. p. q.	–	–
	6 p.m.	N.E.	4	b. c. p. q.	–	–
	midnight	N.E.	3	b. c.	–	–
26 „	6 a.m.	N.E.	3 to 5	b. c. q.	–	–
	2 p.m.	E.N.E.	3	c.	–	–
	10 „	Ey.	3	b. c. p.	–	–
27 „	6 a.m.	Ey.	2	b. c. p.	–	–
	noon	S.E.	2	b. c.	–	–
	6 p.m.	–	–	–	–	–
	midnight	S.E.	2	b. c. p.	–	–
28 „	6 a.m.	Ey.	2	b. c. p.	–	–
	noon	Ey.	2	c. q.	–	–
	6 p.m.	N.E.	2 to 3	b. c. p.	–	–
	midnight	Calm	0	b. c.	–	–
29 „	6 a.m.	N.	1 to 2	b. c.	–	–
	noon	N.E.	2	b. c.	–	–
	6 p.m.	N.	1	b. c.	–	–
	midnight	Calm	0	b. c.	–	–
30 „	6 a.m.	W.	2	b. c.	–	–
	noon	–	3	b. c.	–	–
	6 p.m.	–	2	b. c.	–	–
	midnight	Calm	0	b. c.	–	–

DECEMBER.

Day.	Hour.	Direction.	Force.	Weather.	Bar.	Therm.
1 Dec.	6 a.m.	W.N.W.	2	b. c.	–	–
	noon	N.W.	3	b. c.	–	–
	6 p.m.	N.N.W.	3	b. c.	–	–
	midnight	Calm	0	b. c.	–	–
2 „	6 a.m.	N.N.W.	1 to 3	b. c.	–	–
	noon	–	–	–	–	–
	6 p.m.	N.	1	–	–	–
	midnight	Calm	0	–	–	–
3 „	6 a.m.	S.	1	b. c.	–	–
	noon	–	2	b. c.	–	–
	6 p.m.	–	–	–	–	–
	midnight	Calm	0	b. c.	–	–
4 „	6 a.m.	Calm	0	b. c.	–	–
	noon	S.S.W.	3	b. c.	–	–
	6 p.m.	S.W.	–	–	–	–
	midnight	S.S.W.	2 to 3	b. c.	–	–
5 „	6 a.m.	S.S.W.	3	b. c.	–	–
	noon	S.	3 to 4 to 5	b. c. q.	–	–
	6 p.m.	–	3	b. c.	–	–
	midnight	Calm	0	b. c.	–	–
6 „	6 a.m.	Calm	0	b. c. p.	–	–
	noon	S.	2 to 3	b. c. p.	–	–
	6 p.m.	S.	2	b. c. p.	–	–
	midnight	Calm	0	b. w. c.	–	–

METEOROLOGICAL NOTES abstracted from the Log kept by Captain *Pullen*, R. N., &c.—*continued.*

DECEMBER—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
7 Dec.	6 a.m.	Calm	0	b. c.	–	–
	noon	S.	1 to 2	b. c.	–	–
	6 p.m.	–	–	–	–	–
	midnight	Calm	0	b. c. w.	–	–
8 ”	6 a.m.	Calm	0	b. c. w.	–	–
	noon	S.	2	–	–	–
	6 p.m.	S.	2	b. c. w.	–	–
	midnight	Calm	0	b. c. w.	–	–
9 ”	6 a.m.	Calm	0	b. c. w.	–	–
	noon	S.	1 to 2	b. c.	–	–
	6 p.m.	S.	2	b. c.	–	–
	midnight	Calm	0	b. c. w.	–	–
10 ”	4 a.m.	Calm	0	b. c. w.	–	–
	8 ”	S.	1	b. c.	–	–
	noon	S.E.	3	b. c.	–	–
	6 p.m.	S.E.	2	b. c.	–	–
	midnight	S.	1	b. c. p.	–	–
11 ”	6 a.m.	Calm	0	b. c.	–	–
	noon	S.S.W.	2	b. c.	–	–
	6 p.m.	S.W.	3	c.	–	–
	midnight	–	–	–	–	–
12 ”	6 a.m.	S.W.	3	c. p.	–	–
	noon	W.	4 to 6	o.q.v.l.t.	–	–
	6 p.m.	–	3	c. p.	–	–
	midnight	N.W.	2	c.	–	–
13 ”	6 a.m.	N.	2	b. c.	–	–
	noon	–	3	–	–	–
	6 p.m.	–	2	–	–	–
	midnight	Calm	0	b. c.	–	–
14 ”	6 a.m.	Calm	0	b. c.	–	–
	noon	S.	1 to 2	b. c.	–	–
	6 p.m.	–	–	–	–	–
	midnight	Calm	0	c.	–	–
15 ”	6 a.m.	S.W.	3	c. d.	–	–
	noon	W.	4 to 6	o. q. v.	–	–
	6 p.m	N.	1 to 2	c.	–	–
	midnight	Calm	0	b. c.	–	–
16 ”	6 a.m.	Calm	0	b. c.	–	–
	noon	E.	1	–	–	–
	6 p.m.	–	–	–	–	–
	midnight	Calm	0	–	–	–
17 ”	6 a.m.	Calm	0	b. c.	–	–
	noon	W.	1	b. c.	–	–
	6 p.m.	–	2 to 3	–	–	–
	midnight	–	–	c.	–	–
18 ”	6 a.m.	W.	2	b. c.	–	–
	noon	N.	1	–	–	–
	6 p.m.	–	2	–	–	–
	midnight	–	–	–	–	–
19 ”	6 a.m.	Calm	0	b. c.	–	–
	noon	S.	2	–	–	–
	6 p.m.	–	2	–	–	–
	midnight	S.W.	4	c. q.	–	–

DECEMBER—*continued.*

Day.	Hour.	Wind.		Weather.	Height of	
		Direction.	Force.		Bar.	Therm.
20 Dec.	6 a.m.	W.	5 to 6	c. q. p.	–	–
	noon	W.	6	–	–	–
	6 p.m.	N.	5	–	29·90	60·
	midnight	–	–	–	–	–
21 ”	6 a.m.	Calm	0	b. c.	29·90	58·
	noon	S.	2	b. c.	29·89	62·
	6 p.m.	S.	5	–	29·88	60·
	8 ”	–	6	c. q. p.	–	–
	midnight	–	–	–	29·90	56·
22 ”	6 a.m.	S.	6 to 7	c. q. p.	29·92	56·
	noon	S.S.W.	–	c. q. p.	29·94	60·
	6 p.m.	S.W.	–	–	29·95	58·
	midnight	–	–	–	–	–
23 ”	6 a.m.	W. by N.	6	b. c. p. q.	29·96	56·
	noon	W.N.W.	–	–	30·12	62·
	6 p.m.	N.W.	–	–	30·28	58·
	midnight	–	–	–	–	–
24 ”	6 a.m.	Calm	0	b. c.	30·46	60·
	noon	S.W.	2	b. c.	30·386	69·
	6 p.m.	–	1	–	30·35	66·
	10 ”	–	–	–	30·32	65·
	midnight	Calm	0	b. c.	–	–
25 ”	6 a.m.	Calm	0	b. c.	–	–
	noon	N.	1 to 2	c.	–	–
	6 p.m.	N.W.	3	c.	–	–
	midnight	Wy.	3	c. q. p.	–	–
26 ”	6 a.m.	S.W.	3	c. p.	30·00	66·
	noon	S.S.W.	–	–	29·97	70·
	6 p.m.	S.	4	c. q. p.	29·95	68·
	10 ”	–	–	–	29·90	66·
	midnight	–	6	c. q. p.	–	–
27 ”	6 a.m.	S.	6 to 8 to 10	o. q. p.	30·048	70·
	8 ”	–	–	–	–	–
	noon	S.W.	3	c. v.	29·99	73·
	6 p.m.	W.	2	b. c.	30·06	73·
	10 ”	–	–	–	30·22	72·
	midnight	Calm	0	–	–	–
28 ”	6 a.m.	Calm	0	c.	30·32	74·
	noon	S.	1	c. g.	30·24	74·
	6 p.m.	–	2	–	30·19	74·
	8 ”	–	–	–	30·20	75·
	midnight	–	3	–	–	
29 ”	6 a.m.	S.	3	c. g.	30·08	74·
	noon	–	6 to 8	o. q.	30·04	76·
	6 p.m.	–	7	o. q.	29·94	74·
	10 ”	–	3	o. v.	29·96	75·
	midnight	S.W.	–	–	–	–
30 ”	6 a.m.	S.W.	2	c.	30·11	70·
	noon	W.	2	b. c.	30·21	74·
	6 p.m.	–	1 to 2	–	30·23	73·
	10 ”	–	–	–	30·288	71·
	midnight	Calm	0	–	–	–
31 ”	6 a.m.	Calm	0	b. c.	30·34	68·
	noon	S.	2	c.	30·33	76·
	6 p.m.	S.	2	c. p.	30·325	75·
	midnight	S.	3	c. p.	–	–

BERMUDA (YELLOW FEVER).

EXTRACT from a DESPATCH from the Governor of *Bermuda* to the Secretary of State for the Colonies, forwarding the REPORT of the COMMITTEE appointed to inquire into the Origin and Spread of the YELLOW FEVER, by which *Bermuda* was visited in 1864, together with the Appendices.

(*Mr. Adderley.*)

Ordered, by The House of Commons, *to be Printed,*
4 *August* 1866.

[*Price* 2*s.* 9*d.*]

477.

Under 16 *oz.*

SCURVY.

RETURN to an Order of the Honourable The House of Commons,
dated 3 July 1871;—*for*,

COPY "of CORRESPONDENCE between the Board of Trade or other Bodies or Persons on the Subject of SCURVY in MERCHANT SHIPS; together with the RESULTS of any INQUIRIES on the subject (in continuation of Parliamentary Paper, No. 126, of Session 1867)."

Board of Trade,
7 August 1871.

T. H. FARRER.

(*Mr Alderman Lusk.*)

Ordered, by The House of Commons, *to be Printed,*
8 *August* 1871.

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Part I.

COPY of Correspondence between the Board of Trade or other Bodies or Persons on the subject of Scurvy in Merchant Ships.

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— No. 1. —

(M. 4044.)

Seamen's Hospital Society to Board of Trade.

Seamen's Hospital Society,
86, King William-street, E.C., 16 May 1867.

Sir,

I am desired to report to you, for the information of the Lords of the Committee of Privy Council for Trade, that the disease of sea-scurvy, so far as the admissions on board the hospital ship "Dreadnought," appears to continue at the high rate of last year.

Up to the close of last month, the cases of scurvy received by us have amounted to no less than 37, all of which, with but one exception, have come from British vessels.

This fact leads the Committee to urge upon their Lordships the importance of some legislative enactment upon the subject during the present Session; and I am accordingly requested to ask their Lordships' attention to a question of so much importance, and to remind you of my letter written for a similar purpose on the 1st May 1866.

I am, &c.
(signed) *Kemball Cook*, Secretary.

T. H. Farrer, Esq.,
Board of Trade.

— No. 2. —

(M. 4140.)

India Office to Board of Trade.

Sir, India Office, S.W., 20 May 1867.

I am directed by the Secretary of State for India in Council, to forward herewith, for the information of the Lords of the Committee of Privy Council for Trade, a copy of a communication which has been received from the Government of Bombay, together with the enclosures therein referred to, regarding the large number of scurvy cases found amongst the crews of merchant sailing vessels which arrive at Aden from Europe.

I have, &c.
(signed) *G. Cochrane*,
Assistant Military Secretary.

The Secretary, Board of Trade.

Enclosure 1, in No. 2.

Extract Bombay Marine Letter, dated 10th April 1867, No. 14.

2. We transmit, for the purpose of being communicated to the Board of Trade, the accompanying copy of a letter from the Inspector General, Medical Department, No. 975, dated 25th March 1867, with enclosure, bringing to notice the large number of scurvy cases found amongst the crews of merchant sailing vessels which arrive at Aden from Europe.

Enclosure 2, in No. 2.

(No. 975 of 1867.)

From the Inspector General, Medical Department, to the Secretary to Government, Marine Department; dated 25th March 1867.

Sir,

The Annual Report of the medical officer in charge of the European General Hospital at Aden, contained the following remarks concerning scurvy in merchant ships which arrived at that port:—

"Among the shipping which have reached this port, I allude to such as bring coals for the use of the P. and O. and M. I. companies; the chief admissions into this hospital have been from scurvy; and I regret much that such things should be, since I fully believe that, with a proper care and attention in fitting out these vessels, in relation to anti-scorbutic diets, such would arrive at this port as healthy as do the crews of Her Majesty's ships of war, and a great saving in men, money, and *morale* to the owner would result."

2. The subject of scurvy in merchant ships being one which is naturally exciting much interest and attention at home, the remarks of Mr. Turner appeared to me to require more explicit information, and that officer was accordingly addressed. His reply I have now the honour to forward, for the information and consideration of the Right Honourable the Governor in Council.

3. The ships more particularly alluded to are,—

The "Emily Augusta,"	from	Birkenhead	167 days out.
The "Mangerton"	,,	Sunderland	121 ,,
The "Travancore"	,,	Liverpool	139 ,,

And other ships, names not mentioned, from which scurvy cases were sent for treatment, were from Liverpool, Sunderland, and Cardiff.

I have, &c.
(signed) *F. S. Arnott*, M.D., C.B.,
Inspector General, Medical Department.

Bombay, 25 March 1867.

Enclosure 3, in No. 2.

(No. 31 of 1867.)

To the Secretary Inspector General, Medical Department, Bombay.

Sir,

IN reply to your letter, No. 424, dated the 5th February 1867, I have the honour to state, for the information of Inspector General, Medical Department, that, during the year 1866, 66 cases of scurvy, chiefly of a very severe type, have been admitted into the European General Hospital; yet of these more than half have been from three ships, viz., "Emily Augusta," from Birkenhead; "Mangerton," from Sunderland; and "Travancore," from Liverpool, respectively 167, 121, and 139 days "en voyage." The men of the former vessel average 30 days under treatment, and of the two latter 14 and 22 respectively; the remainder in twos and threes from other ships, chiefly from Liverpool, Sunderland, and Cardiff, in Wales.

2. In some ships the whole of the crew was said to be more or less tainted; but my remarks bore special reference only to the more severe form of the disease.

3. I beg to append extracts from monthly returns from European General Hospital, furnished to your office in 1866:—

> January.—" Several severe cases of scurvy with paralysis have been under treatment. One scurvy abscess with tibia exposed."
>
> February.—" Two scurvy cases, complicated with obstinate diarrhœa, proved fatal. One case of scurvy, in a state of henupplegia, quite helpless, and not likely to recover."
>
> March.—" One fatal case from scurvy and henupplegia." The case referred to above.
>
> October.—" Three bad sloughing scorbutic ulcer cases, one of whom, I fear, will succumb under treatment."
>
> November.—" A case of severe scurvy, with anæmia and general tissue effusion, proved fatal from asthenia."
>
> December.—" Scurvy cases have been mostly those admitted. Some of a severe nature."

4. With reference to paragraph 3 of your letter, I may state that the only anti-scorbutic provision made for these ships is the limejuice (a very questionable compound) authorised by Act of Parliament.

5. In conclusion, I have the honour to append extract on this subject from my Annual Report from European General Hospital for the year 1865:—

> " It is much to be regretted that stricter medical surveillance is not imposed by the shipping authorities in Great Britain, when entertaining an European crew for long voyages; also in examining the provisions, water, and limejuice sent on board ship for the use of the sailors, and ensuring a supply of preserved potatoes and pickles for occasional use during a long and tedious voyage; for I feel convinced if such were observed it would be a saving in expense to masters and owners, and afford increased health and comfort to the crew, since scarcely a ship comes to this port that some of the men are not treated either for scurvy or disease of the bowels, originating in a deficiency of vegetable food in which the salts of potash exist. In one ship (I may state, however, she was a Portuguese sailing from Lisbon) the expense incurred at the European General Hospital for the treatment of scurvy cases was 32 *l.*, which amount, had it been laid out in good limejuice and preserved potatoes, the services of the poor cripples would have been preserved to the ship, and the expense of providing substitutes in coolies avoided; yet, from what I can glean from among the masters, so long as the ship goes to sea, very little is considered by the owners as to the nature of the crew, or their provision over dreary months of monotony."

I have, &c.
(signed) *J. Turner*, Surgeon Major,
Superintendent, Medical Department,
Aden Field Force.

Aden, 8 March 1867.

— No. 3. —

(M. 5009.)

Peninsular and Oriental Steam Navigation Company to Board of Trade.

Peninsular and Oriental Steam Navigation Company,
Offices, 122, Leadenhall-street, London, E.C.,
27 June 1867.

Sir,

Referring to your letter of the 7th instant (No. 3888), and to my reply of the 11th idem, relative to the supply of water at Aden, I have now the honour to transmit to you, for the information of the Board of Trade, copy of a report on the subject from Mr. Luke Thomas, formerly the Company's agent at Aden, which the directors think their Lordships will agree with them in considering to be a very lucid and comprehensive document.

I have, &c.
(signed) ,
Secretary.

The Assistant Secretary,
Marine Department, Board of Trade.

Enclosure in No. 3.

REPORT respecting the Supply of Water at *Aden* in connection with the Disease of Scurvy.

When Aden became a British Settlement in 1839, and for nearly 20 years afterwards, it depended wholly for its supply of water from numerous wells within itself, nearly all of which (upwards of 100 in number) were more or less brackish, and only fit for culinary and other domestic purposes; five or six alone yielding "drinking water" in limited quantity, and quite inadequate to meet the requirements of the garrison, inhabitants, and shipping.

These wells are much affected for the better by the occurrence of a rain storm, and the reverse by the long continued absence of one. Such storms are very uncertain in their visits, and sometimes there is an interval of four or five years between them, and then the inhabitants (especially the poor) are subjected to great privation, for not only does the quantity diminish, but the quality deteriorates.

About 1857 the Government commenced clearing out and repairing some ancient tanks or reservoirs, which led to the discovery of others buried in the debris, and lost to sight for ages. This work, which took some years to accomplish, was followed up until a magnificent system of reservoirs capable of containing eight million gallons of water were exposed to view. Unfortunately the hopes entertained when this great and expensive work was undertaken have not been fully realised. The reservoirs have been filled once only since their restoration; that was about three years ago, the supply then obtained lasted nearly 18 months, since then they have remained dry; there not having occurred in the meantime a storm sufficiently heavy to affect them; mere showers do no good to either wells or reservoirs, as they are evaporated on the heated surface of the rock before reaching the one or the other.

With the view of bettering the supply of water to the ships of the Indian navy, and for general purposes arrangements were made about the same time (1857) to get water from the north side of the harbour, where it is found at no great distance from the beach, the quality was, however, very inferior, and lying beyond the British frontier beset with so many difficulties that the project was ultimately abandoned.

Scurvy is the common disease of Aden, the natives of India especially suffer much from it, and Europeans become more or less affected by it after a long residence; and this is attributed to the use of unwholesome water chiefly. It need scarcely be added, that where water was insufficient for the people of the place, the coal ships were only allowed that of an inferior quality.

To obviate this state of things the Peninsular and Oriental Steam Navigation Company in 1857 set up a still for condensing water from the sea, capable of turning out 3,500 gallons per day; and for the following five years from that time I am able to state that this was not only found sufficient to meet the wants of the company's establishment and steamers, but all the coal ships, Royal Navy, and other vessels; and besides was of the greatest possible value in supplying the troops on their way to India during the Mutiny. This water, after coming from the still, is filtered through animal charcoal, and run into iron tanks; its quality has been pronounced exceptionally good by naval and military officers, and other competent persons.

Since I left the station, about six years ago, I presume the coal vessels have drawn their supply of water from the same source, more especially as the company have in the meantime added a second still to their establishment, and can turn out 7,000 gallons per day, if required. No doubt the demand for this water has much increased of late; a large portion of the garrison are now quartered on the harbour side of the settlement, and the officers and others are glad to get it, not only on account of its superior quality, but as a matter of convenience, the wells and reservoirs being distant from this point five miles, and the means of carriage expensive, it having to be brought in skins on camels or donkeys.

Soon after the Peninsular and Oriental Steam Navigation Company got their still at work the Government sent out one from England and placed it at the isthmus intended for the use of the troops stationed in that quarter in case of emergency only and therefore not generally worked. The Government also sent up another still from Bombay for the harbour; this was an inferior one and did not produce much; it was under the charge of Commissariat Department and applied to the wants of the military.

The French Steam Company have a still sufficient to supply their own establishment and vessels.

This is how matters stood when I was in Aden last winter, and although there was some delay then in obtaining condensed water for the merchant shipping, I believe they all got it in the end.

At the present time there is a new still on the way out for the Government, also a new set of boilers for the Peninsular and Oriental Steam Navigation Company, and a condenser of large capacity is in course of construction for a private firm, and which is expected to be at work by the end of the year, therefore from this time forward the merchant shipping will experience no difficulty whatever in obtaining as much condensed water as they may require.

Having now stated to the best of my knowledge the position of Aden with regard to its supply of water past and present, I beg to offer a few observations the result of a long residence there bearing on the question under consideration.

With respect to the health of the ships after their departure from Aden I have no means of information, but I know as a fact, that many of them when they arrive there are more or less affected with scurvy; one case in particular I remember had nearly the whole crew, from the captain down prostrated by it, so much so that assistance had to be sent to bring the ship into the harbour. On arrival at Aden scurvy cases are sent to the hospital and generally soon yield to change of diet and proper treatment, and rarely prove fatal. It is however very probable that many cases for want of time to recover entirely are returned to their ships in a convalescent state and thus enter on another voyage under the same condition with respect to diet in which the disease originated, and it is reasonable to suppose it would appear again if the voyage should be a long one.

In many instances I have no doubt the disease is in the ship on arrival, but not sufficiently developed to be sent to the hospital during their stay in Aden. On a liberal fresh dietary their health would improve, at any rate the disease would be checked for the time; but when they go to sea again and return to salt provisions the disease would be likely to become more active, and if the ship had been supplied with Aden water their position would be greatly aggravated.

At any rate, whatever happens after the ship leaves Aden it is certain many are affected before they arrive there; and with regard to them Aden water can have nothing whatever to do.

I do not state it as a fact, but I have an idea that ships laden with patent fuel are more subject to scurvy than those laden with common coal; and this impression was strengthened when in Aden a few months ago I heard it remarked that vessels bringing coal for the French Company appeared to suffer more from scurvy than those that brought it for the Peninsula and Oriental Steam Navigation Company. The fact being the French Company are supplied chiefly with patent fuel and the Peninsula and Oriental Steam Navigation Company with ordinary coal.

If it should be considered worth while to ascertain whether this theory is supported by facts, a return should be got from the Naval Hospital at Aden of all cases of scurvy admitted from the time of its establishment, or as far back as possible, showing the names of the ship and date; the documents could then be completed in London by inserting the description of the cargoes of those ships. It would be more valuable still if a return of all ships sent to Aden with coal for a number of years back could be got, as then a comparison could be made between the healthy ships and the diseased ones, and that also would show whether the disease is on the increase or otherwise, so far as concerns ships going to Aden.

Tunbridge Wells, 20 June 1867. (signed) *Luke Thomas.*

To the Managing Directors
of the Oriental and Steam Navigation Company,
London.

— No. 4. —

(M. 5009.)

Board of Trade to India Office.

Board of Trade, Whitehall.
3 July 1867.

Sir,

Referring to the correspondence between this Board and the India Office on the subject of the supply of water at Aden, and upon the probable causes of the prevalence of sea scurvy on board vessels touching there and obtaining water, I am directed by the Board of Trade to state, for the information of the Secretary of State for India, that they have received a very interesting report on the subject from Mr. Luke Thomas, lately agent to the Peninsular and Oriental Steam Navigation Company for many years, at Aden.

After mentioning the great improvements now in progress at Aden for procuring a better supply of water, he says that he has noticed that, although many persons are doubtless affected through drinking the bad water at the port, yet that, at the same time, many are affected before they arrive there, and he points out that Aden water can have nothing to do with these latter cases.

Referring to these cases, he states that he has the impression that ships laden with patent fuel are more subject to scurvy than those laden with common coal, and that this idea was strengthened a few months ago, from his having heard that vessels bringing coal for the French Company appeared to suffer more from scurvy than those that brought it for the Peninsular and Oriental Steam Navigation Company; the fact being that the French Company are chiefly supplied with patent fuel, and the Peninsular and Oriental Steam Navigation Company with ordinary coal.

That part of Mr. Thomas's letter to which this Board would wish to draw special attention, is where he suggests that a return should be got from the Naval Hospital at Aden of all cases of scurvy admitted from the time of its establishment, or as far back as possible, showing the names of the ships from which cases were admitted, and the dates of admission, and if possible the nature of the cargo.

The Board of Trade being anxious to obtain as much information as possible on the subject of sea scurvy, direct me to state that they will be glad if the Secretary of State for India would give directions for the preparation of such a return, provided he sees no reasons to the contrary. Should the Secretary of State for India not see any objection, they will be glad if he would give directions that such a return be made.

I have, &c.
(signed) *Thomas Gray*.

The Under Secretary of State, India Office.

— No. 5. —

(M. 5702.)

India Office to Board of Trade.

Sir, India Office, S.W., 27 July 1867.

I am directed by the Secretary of State for India in Council to acknowledge the receipt of your letter of 3rd instant,* on the subject of the supply of water at Aden, and upon the probable causes of the prevalence of sea scurvy on board vessels touching at that place; and in reply I am to state, in reference to the two last paragraphs of your letter under notice, that instructions will be sent to the Government of Bombay for the preparation of a return, such as that required by the Board of Trade; but before doing so Secretary Sir Stafford Northcote wishes to be furnished with a blank form of the return embracing all the particulars required by the Board of Trade for transmission to Bombay.

*See *ante*, No. 4.

I have, &c.
(signed) *T. T. Pears*, Major General,
Military Secretary.

The Secretary,
Board of Trade.

— No. 6. —

(M. 5702.)

Board of Trade to India Office.

Board of Trade, Whitehall,
6 August 1867.

Sir,

In compliance with the request contained in your letter (No. 2812) of the 27th ultimo,* I am directed by the Board of Trade to transmit to you, for the information of the Secretary of State for India in Council, the accompanying blank form for a return, with reference to the supply of water at Aden, which the Board think will embrace all the particulars required.

*See *ante*, No. 5.

The Under Secretary of State
for India, India Office.

I have, &c.
(signed) *Robert G. W. Herbert.*

Enclosure in No 6.

STATEMENT showing all the Cases of Scurvy which were admitted into the Naval Hospital at *Aden* in each Year ending 31st December since its establishment, giving, as far as possible, the following particulars:—

Particulars of Ship.				Particulars of Voyage.				Date of Arrival at Aden.	Scurvy Cases on Board.		Supposed Cause of Outbreak.	Remarks.
				Commencement of Voyage.		Last Port of Departure.						
Name.	Official Number.	Port of Registry.	Nature of Cargo.	Port.	Date.	Name.	Date of Leaving.		Total Number.	Number sent to the Hospital at Aden.		

— No. 7. —

(M. 5953.)

India Office to Board of Trade.

Sir, India Office, S.W., 7 August 1867.

I am directed by the Secretary of State for India in Council to acknowledge the receipt of your letter of 2nd instant (M. 5672), and to acquaint you in reply that a copy of that letter will be forwarded to the Government of Bombay with directions to cause the authorities at Aden to institute an investigation into the circumstances of the outbreak of scurvy among the crew of any vessel arriving hereafter at Aden, no investigation having been made in the case of the ship "G. A. Holt," as far as is known at this office.

I have, &c.
(signed) *T. T. Pears*, Major General,
Military Secretary.

The Secretary,
Board of Trade.

— No. 8. —

(M. 2535.)

Indian Office to Board of Trade.

Sir, India Office, S.W., 28 February 1868.

From Board of Trade, 3 July 1867, No. M. 5009.
To -- ditto - 27 July 1867, No. 2812.
From - ditto - 6 August 1867, No. 5702.

Marine Letter, No. 50. Dated 25 Nov. 1867.

With reference to the correspondence noted in the margin, on the subject of the supply of water at Aden, and upon the probable causes of the prevalence of sea-scurvy on board vessels touching at that place, I am directed by the Secretary of State for India in Council to forward herewith a copy of a letter which has been received from the Government of Bombay, together with the original statement which accompanied it, showing the cases of scurvy admitted yearly into the Naval Hospital at Aden, from March 1853 to September 1867; as also a copy of a special report on the subject by the Superintendent, Medical Department, Aden.

I am, &c.
(signed) *T. T. Pears*, Major General,
Military Secretary.

The Assistant Secretary,
Marine Department, Board of Trade.

Enclosure 1, in No. 8.

(Marine Department.—No. 50 of 1867.)

To Her Majesty's Principal Secretary of State for India, India Office, London.

Right Honourable Sir, Bombay Castle, 25 November 1867.

Referring to your Despatch, No. 103, dated 31st August last, we have the honour to forward copy of a letter from the Inspector General of Ordnance and Magazines, No. 3796, dated 15th November, and its accompanying statement, showing the cases of scurvy admitted yearly into the Naval Hospital at Aden, from March 1853 to September 1867; together with a copy of a special report on the subject by the Superintendent, Medical Department, Aden.

We have, &c.
(signed) *W. R. S. V. FitzGerald.*
B. H. Ellis.

Enclosure 2, in No. 8.

(No. 3796 of 1867.)

From the Inspector General, Indian Medical Department, to the Secretary to Government, Marine Department; dated 15th November 1867.

Sir,

WITH reference to Government Resolution, No. 606, Marine Department, dated 3rd ultimo, forwarding copies of correspondence from the Secretary of State for India to the Board of Trade, on the subject of scurvy amongst the crews of merchant vessels arriving at Aden, I have the honour to transmit the statement therein called for, with an accompanying report from the Superintendent, Medical Department, at that place.

2. The statement commences with 1853, and terminates with September 1867, during which period there were treated for scurvy, as hospital cases, 493 seamen. During the last five years, the highest number received from one ship was 20 from the "Asia," from Cardiff, in 1865; and during the present year, up to September, 35 cases were admitted into hospital.

3. The remarks made by the Superintendent, Medical Department, Aden, on the engagement of sailors at home, attendance to their greater comfort on voyages, &c. &c., are worthy of attention: and I quite concur with that officer in absolving the Aden condensed water from all blame in the matter of producing scurvy in the merchant seamen leaving that port; the cause of this disease must be looked for, and remedied nearer home.

I have, &c.
(signed) *F. S. Arnott*, M.D., C.B.,
Inspector General, Indian Medical Department.

Bombay, 15 November 1867.

Enclosure 3, in No. 8.

SPECIAL REPORT.

Aden, 1 November 1867.

THE date of my assuming the post of Medical Superintendent at Aden, with supervision of the European General Hospital, was in June 1864; but I have given some records for former years, yet others have been unfortunately lost sight of.

2. It has rarely been deemed necessary to record the cause of scurvy admissions in the several monthly reports, this being so patent, viz., the absence of a proper supply of anti-scorbutics, light French acid wines, fresh or preserved vegetables, at times bad water, and perhaps a poor description of diet, and limejuice, so called, yet pertaining little to the normal juice, being a nauseous adulterated compound, added to which cause a foul condition of the seaman's quarters on board the ships which, for the conveyance of coal for Aden, are usually the very old craft making long passages, sometimes six months, all open for improvement. Still I am inclined to the belief that if every man were inspected by a medical officer before being shipped, one of many causes would be avoided, since my experience reminds me of many instances of the disease being of old standing.

3. From intercourse with many sufferers, for I have seen and reported on several deplorable cases which have been brought to hospital on arrival of coal ships at Aden in the very ast stage of this terrible disease, aye, in some instances, moribund, I have learnt the sad truth that want, from probably their own indiscretion, has driven many a man to re-ship when scarcely a week had elapsed from arrival, after a former long voyage, with possibly the taint of scurvy in the system.

4. I am urged to record the above, since it has come to my knowledge, officially, that the water obtained at Aden, chiefly condensed, is set down as the cause of scurvy; this is simply a false statement; otherwise, why do our European soldiers, whose drink it chiefly is, enjoy an almost perfect immunity from the disease, after a residence of two years at this out-post, sailors remaining but two months usually?

The facts are these—

1st. On a ship arriving, the very severe cases alone are sent to hospital; the most, or nearly all the crew, are tainted with the disease, and no supervision being hitherto enjoined, after a sojourn here of two months or more, little or no vegetable matter being procurable, the ships sail for Rangoon, Akyab, Callis, or other distant ports, and after a long voyage the master reports scurvy on board, the result "of drinking the Aden water." I repeat such is false, and a libel, since I have drunk it for a period of nearly four years without any, to me, apparent ill effect.

(signed) *J. Turner*, Surgeon Major,
Superintendent, Medical Department,
Aden Field Force, and European General Hospital.

— No. 9. —

(M. 5472.)

India Office to Board of Trade.

Sir, India Office, S.W., 26 May 1868.

* See *ante*, No. 8.

Dated 16 April 1868, p. 1. No. 13.

With reference to the letter from this office to your address, dated the 28th* February last (No. 1337), in which was transmitted a statement showing the cases of scurvy admitted yearly into the Naval Hospital at Aden, from March 1853 to September 1867, I am directed by the Secretary of State for India in Council to forward herewith a copy of an extract of a Marine Letter which has just been received from the Government of Bombay, together with a further statement of the number of scurvy cases admitted into the hospital at Aden during the month of January last from the merchant ships that arrived at that port.

I am, &c.
(signed) *T. T. Pears*, Major General,
Military Secretary.

The Assistant Secretary,
Marine Department, Board of Trade.

Enclosure in No. 9.

Extract Bombay Marine Letter, dated 16th April 1868, No. 13.

1. Referring to your Despatch, No. 103, dated 31st August 1867, we have the honour to transmit the accompanying statement showing the number of scurvy cases on board, and admitted into the European General Hospital at Aden, during the month of January 1868, from the merchant ships that arrived at that port.

STATEMENT showing all the Cases of SCURVY which were Admitted into the EUROPEAN GENERAL HOSPITAL during the Month of January 1868.

Particulars of Ship.				Particulars of Voyage.				Date of Arrival in Aden.	Scurvy Cases on Board.		Supposed Cause of Outbreak.	REMARKS.
——	Official Number.	Port of Registry.	Nature of Cargo.	Commencement of Voyage. Port.	Commencement of Voyage. Date.	Last Port of Departure. Name.	Last Port of Departure. Date of Leaving.		Total Number.	Number sent to Hospital at Aden.		
Nimrod - -	47,318	London -	Coal -	Liverpool -	5 Sept. 1867	- - Same - -		4 Jan. 1868	2	2	Deficiency in vegetable diet; over-crowded and dirty accommodation. This ship having a hurricane deck for the men's berths was fairly ventilated. Probably some men were tainted ere shipping.	These will apply to all which have been surveyed:— The diet is that laid down by Board of Trade in pursuance of 17 & 18 Vict. c. 104. The provisions I inspected and tasted, and all, though perhaps not of the finest quality, were good of their kind, and of the class usually shipped for use of crews of merchant vessels trading to this or other ports, and would be sufficiently nourishing if supplemented with a ration of potatoes three times a week and fresh meat once. Lime juice similar in quality to that served out by the Commissariat here, and containing but a small proportion of the salts of potass, indiscriminately served out, and no care taken to ensure its being drank. This addendum, when pure, is doubtless a beneficial proplylactic, but of little value when unsupplemented on a long voyage of four or five months. The water I tasted was remnant of that procured in England, and had not run short, yet when rain fell *en voyage* it was collected and made available for drinking and cooking purposes as a temporary measure.
King of Algeries -	–	Liverpool -	„	Shields -	17 Aug. 1867	- - „ - -		6 Jan. 1868	2	2	Ditto; accommodation below crowded and dirty; also badly ventilated.	
Richard Rylands -	–	- -	„	- -	- - -	- - „ - -		- - -	- -	1	One or two cases very slight, and in consequence no survey was deemed necessary.	
Caroline Hutchings	–	- -	„	- -	- - -	- - „ - -		- - -	- -	1		
Calcutta - -	–	- -	„	-	- - -	- - „ - -		- - -	- -	1		
Sea Wave - -	–	London -	„	Newport -	18 Sept. 1867	- - „ - -		22 Jan. 1868	6	1	Deficient vegetable diet; over-crowded and dirty accommodation; badly ventilated; also 126 days at sea. Perhaps tainted ere leaving.	
Annie Comrie -	43,599	Newcastle -	„	Shields -	5 Aug. 1867	- - „ - -		26 Jan. 1868	Whole crew tainted.	5	Ditto; 175 days at sea.	
								TOTAL - - -	10	13		

Aden, 1 February 1868.

J. Turner, Surgeon Major,
European General Hospital.

— No. 10. —

(M. 5472.)

Board of Trade to India Office.

Board of Trade, Whitehall,
2 June 1868.

Sir,

I am directed by the Board of Trade to acknowledge the receipt of your letter of the * 26th ultimo, transmitting, by desire of the Secretary of State for India in Council, a copy of an extract from a "Marine Letter," which has been received from the Government of Bombay, accompanied by a statement of the number of scurvy cases admitted into the hospital at Aden during the month of January last.

*See *ante*, No. 9.

In reply, I am to request that you will move Sir Stafford Northcote to cause the surgeon major of the hospital to be informed, with reference to the remarks on the statement in question, that the Board of Trade do not lay down, and have no power to lay down, dietary scales, as he appears to suppose.

The Merchant Shipping Acts make no mention of dietary scales, but leave them to be settled between the owner and the crew at the time of engagement.

I am also to enclose a copy of the Merchant Shipping Act of 1867, section 4 of which provides for the supply to vessels of properly inspected and fortified lime or lemon juice. Copies of Circular Instructions issued to the officers appointed for the carrying the above section into effect are also enclosed; and in requesting you to move Sir Stafford Northcote to cause these documents to be forwarded to the surgeon major at Aden, I am to state that the Board of Trade will be glad to learn from that officer whether in any ships arriving at Aden with scurvy on board the fortified lime juice has been served out, as required by section 4 of the Act, and, if not, whether, so far as he can ascertain, the crew have take any, and, if any, what steps to recover the penalties named therein for default.

Circular No. 271.

Circulars, 274, 277, 289, 301.

I have, &c.
(signed) *Thomas Gray.*

The Under Secretary of State
for India, India Office.

— No. 11. —

(M. 1472.)

Seamen's Hospital Society to Board of Trade.

Seamen's Hospital Society,
86, King William-street, E.C., 3 February 1868.

Sir,

I beg to lay before you, for the information of the Lords of the Committee of the Privy Council for Trade, the nominal list of the cases of scurvy received on board this Society's Hospital Ship "Dreadnought," during the year 1867.

I am, &c.
(signed) *Kemball Cook*,
Secretary.

The Secretary,
Marine Department, Board of Trade.

Enclosure in No. 11.

SEAMEN admitted into the "Dreadnought" Hospital Ship with Scurvy during the Year 1867.

Date of Admssion.	NAME.	SHIP.	Of what Port.	Days at Sea.	From	Quality of Lime Juice, as reported by Patients.	Quality of Water, as reported by Patients.	Quality of Meat, as reported by Patients.	Remarks.
1867 :									
7 Jan.	William Lewis	Macedonia	Newcastle	–	—	—	—	—	
21 ,,	William Roberts	Korri Monia	Glasgow	–	Calcutta	—	—	—	
23 ,,	Thomas May	Knight Companion.	London	127	ditto	Short allowance.	?	Beef bad; pork good.	
29 ,,	Thomas Chapman	Europa	Glasgow	125	ditto	Taken irregularly.	Condensed	Good.	
31 ,,	Joseph Muller	Nagpore	Liverpool	101	ditto	Short allowance.	?	mostly stinking.	
31 ,,	Charles Barnett	Onangondy	ditto	96 ?	Bombay	Seldom taken	Good	?	
1 Feb.	Anders Effort	Europa	Glasgow	105	Calcutta	Bad	?	Good.	
3 ,,	Charles Painter	Centaur	Liverpool	150	ditto	Very bad	?	Beef bad; green.	
6 ,,	James Evans	Orient	ditto	158	ditto	1 month's allowance.	? Short allowance.	Short allowance.	
6 ,,	John Keffe	Europa	Glasgow	105	ditto	?	Condensed	Go d.	
28 Jan.	John Espen	Knight Companion.	London	127	ditto	Short allowance.	?	Beef bad; pork good.	
9 Feb.	Sebastian Anago	Eleona	Bremen	180	Peru	None	Good	Bad.	
9 ,,	Henry Trim	Zoroaster	Bombay	132	Calcutta	Weak	?	Good.	
9 ,,	Henry Sand	ditto	ditto	132	ditto	Weak; taken irregularly.	?	ditto.	
9 ,,	John Kielsen	ditto	ditto	132	ditto	Good	?	ditto.	
9 ,,	John Ashley	Timour	Liverpool	131	ditto	Did not take it	?	-	Died.
9 ,,	Oliver Johansen	ditto	ditto	131	ditto	?	Rain, &c.	Good.	
9 ,,	Thomas Williams	ditto	ditto	131	ditto	?	ditto	ditto.	
9 ,,	Henry Evans	ditto	ditto	131	ditto	Taken irregularly; white.	?	ditto.	
9 ,,	William Williamsen	ditto	ditto	131	ditto	?	? and rain	ditto.	
9 ,,	William McIntyre	ditto	ditto	131	ditto	Taken irregularly.	?	ditto.	
9 ,,	James Doaherty	ditto	ditto	131	ditto	?	?	?	
9 ,,	George Mackie	ditto	ditto	131	ditto	Taken irregularly.	?	Some stinking.	
9 ,,	Henry Else	ditto	ditto	131	ditto	ditto	?	Good.	
11 ,,	Daniel Sinclair	Knight Companion.	London	127	ditto	Not taken	?	Short allowance.	
10 ,,	Christian Rasmusen	Merrington	Fleetwood	120	Cochin, M. C.	Bad	-	Good.	
25 ,,	John Baker	Janet Ferguson	Glasgow	139	Karachi	Taken irregularly.	Partly rain	Beef bad: pork good.	
26 ,,	Edward Jones	Argaum	Newcastle	90	Odessa	None	Good	?	
26 ,,	Pergotie Matthews	ditto	ditto	90	ditto	ditto	ditto	Stinking.	
27 ,,	William Neilsen	Europa	Glasgow	105	Calcutta	Not taken	?	Good.	
29 Mar.	William Hills	Sidney Dacres	Liverpool	90	ditto	Taken irregularly.	?	Bad.	
10 April	Gengirle Auguste	Anchoreah	Greenock	60	Demerara	None	-	ditto.	
13 ,,	Thomas Larsen	Challenge	ditto	115	Calcutta	Good	?	?	
21 ,,	Peter Petersen	J. D. Marshall	S. Shields	120	Tuticorn	—	—	—	
21 ,,	Thomas Jones	ditto	ditto	120	ditto	-	Bad	-	Died.
26 ,,	Donald McKay	Hannah	Greenock	120	Calcutta	Taken irregularly.	?	?	
27 ,,	Charles Henry	Romulus	Bristol	140	Karachi	Good	Rain	Some stinking.	
22 ,,	George Budge	Kelso	Shields	–	Hong Kong	—	—	—	
4 May	Andrew Holstein	Calderon	London	106	Colombo	?	Good	Bad.	
12 ,,	William Ashton	Sultan	ditto	–	ditto	None on the passage home.	Some rain	Good.	
30 ,,	Gimbatto Mortedd	Francisco	Genoa	120	Lagos	None	Good	Bad.	
31 ,,	Edward Beaks	Isabella Blyth	London	–	Mauritius	None taken	?	Good.	
3 July	Henry Porter	Stornoway	ditto	115	Hong Kong	?	Good	Bad.	
14 ,,	Frederick Neilsen	Nonpareil	Sunderland	147	Queensland	Bad	Good	Some stinking.	
14 ,,	William Thornbury	ditto	ditto	147	ditto	Taken irregularly.	Good; and rain.	Bad; some stinking.	
16 ,,	John Jackson	John Rennie	London	165	Singapore	A watery solution of a drug ? citric acid.	Good	Good.	
16 ,,	Henry Morris	Not known	- - -	–	ditto	No particulars.			
18 ,,	Carl Bengden	British Flag	Liverpool	–	Calcutta	—	—	—	
31 ,,	Peter Hendry	Three Bells	Glasgow	135	Rangoon	None taken; bad.	Good	Good.	

SEAMEN admitted into the "Dreadnought" Hospital Ship with Scurvy during the Year 1867—*continued.*

Date of Admission.	NAME.	SHIP.	Of what Port.	Days at Sea.	From	Quality of Lime Juice, as reported by Patients.	Quality of Water, as reported by Patients.	Quality of Meat, as reported by Patients.	Remarks.
1867:									
5 Aug.	Thomas Brown	Trossachs	Dundee	–	Peru	No evidence.			
13 ,,	George O'Neil	Trade Unia	London	45	Accia	Did not take it	?	Maggoty ?	
15 ,,	Thomas Joseph	Catma	Liverpool	180	Java	ditto	Rain	Bad.	
19 ,,	Michael Johnstone	Marian Warren	ditto	136	Bombay	Taken irregularly.	Good	Some bad.	
19 ,,	Carl Carlsen	Cowasjee Jehanjeer	Bombay	145	ditto	?	ditto	Good.	
23 ,,	Peter Teschke	Gazelle	Konigsberg	172	Nagaski	None	Good, and rain	?	
23 ,,	Johand Tamberg	Earl of Southesk	Aberdeen	145	Adelaide	Bad; taken irregularly.	Good	Good.	
26 ,,	Jas. Kelly	West Derby	Liverpool	145	Calcutta	Said to be mixed.	?	Rotten.	
26 ,,	Frank Redmond	ditto	ditto	145	ditto	Taken irregularly.	?	Bad.	
28 ,,	Peter Crawford	Adelina	London	151	Cochin	—	—	—	
28 ,,	John Waugh	ditto	ditto	151	ditto	—	—	—	
28 ,,	Matthew Hamen	ditto	ditto	151	ditto	No particulars.			
29 ,,	Peter Petersan	ditto	ditto	151	ditto	—	—	—	
29 ,,	John Larn	ditto	ditto	151	ditto	—	—	—	
29 ,,	Anders Malingent	ditto	ditto	151	ditto	—	—	—	
20 Sept.	John Hughes	Marlborough	ditto	–	—	—	—	—	
26 ,,	John Williams	Riversdale	Liverpool	120	Calcutta	Taken irregularly.	?	?	
26 ,,	William Walpley	ditto	ditto	120	ditto	ditto	?	? Pork good.	
26 ,,	John Donaldson	ditto	ditto	120	ditto	ditto	?	Good.	
26 ,,	George Stapleton	ditto	ditto	120	ditto	ditto	?	Bad.	
26 ,,	Michael Handyham	ditto	ditto	120	ditto	ditto	?	? Pork good.	
26 ,,	Jas. Faca	ditto	ditto	120	ditto	ditto	?	?	
14 Oct.	William Chatterton	Bride	London	150	Madras	Good; taken regularly.	Good	Good.	
15 ,,	Manuel de Sueija	Eastern Belle	Greenock	150	Calcutta	? Taken irregularly.	?	ditto.	
22 ,,	Jas. Tulloch	Gossamer	Liverpool	125	Shanghai	Taken irregularly.	Good	ditto.	
22 ,,	Peter Ericksen	ditto	ditto	125	ditto	ditto	ditto	ditto.	
22 ,,	Jas. Collins	Campbell	Leith	190	Moulmein	ditto	Rain	ditto.	
22 ,,	Franz Jacobsen	ditto	ditto	190	ditto	No particulars.			
23 ,,	William Carter	Eirene	London	–	Lagos	ditto.			
28 ,,	Trafin Popov	Odessa	Odessa	–	Odessa	ditto.			
22 ,,	John Matthews	Gossamer	Liverpool	125	Shanghai	Taken irregularly.	Good	Good.	
22 ,,	John Gough	ditto	ditto	125	ditto	ditto	ditto	ditto.	
31 ,,	Auguste Johnson	Royal Alfred	ditto	–	Rangoon	Three or four times a week.	ditto	Bad.	
9 Dec.	Thomas Lenkie	Lanercast	ditto	–	Singapore	No particulars.			
12 ,,	Thomas Revill	Peter Denny	Glasgow	144	Shanghai	Did not take it	Good	Good.	
13 ,,	John Fell	Roslin Castle	Liverpool	142	Calcutta	Taken regularly.	?	ditto.	
14 ,,	August Anderson	Peter Denny	Glasgow	144	Shanghai	Bad and black; did not take it.	?	Beef bad; pork good.	
14 ,,	Richard Cowley	ditto	ditto	144	ditto	Bad; did not take it.	?	Beef bad.	
18 ,,	Eric Faine	Silver Eagle	London	–	ditto	No particulars.			
28 ,,	Roland Wardle	Dunmail	Workington	145	ditto	Taken irregularly.	Good	Bad.	
30 ,,	Thomas Dugan	ditto	ditto	145	ditto	No particulars.			

SUMMARY.

London	19 cases.
Liverpool	32 ,,
Glasgow and Greenock	14 ,,
Aberdeen, Dundee, and Leith	4 ,,
Newcastle, Shields, and Sunderland	8 ,,
Bristol, Fleetwood, and Workington	4 ,,
Bombay	4 ,,
Foreign	4 ,,
Not known	1 ,,
TOTAL	90 ,,

— No. 12. —

(M. 2186.)

India Office to Board of Trade.

Sir, India Office, S.W., 8 March 1869.

I am directed by the Secretary of State for India in Council to forward, in continuation of the India Office letter, dated the 4th December 1868, No. 6766, copies of letters, with their enclosures, which have been received from the Government of Bombay, relative to the number of cases of scurvy admitted into the European General Hospital at Aden in October and November 1868.

I am &c.
(signed) *T. T. Pears*, Major General,
Military Secretary.

The Assistant Secretary,
Marine Department, Board of Trade.

Enclosure in No. 12.

(Marine Department.—No. 1 of 1869.)

To Her Majesty's Principal Secretary of State for India, India Office, London.

Right Honourable Sir, Bombay Castle, 5 January 1869.

In continuation of our Despatch, No 43, dated 5th November last, we forward a statement received from the Superintendent, Medical Department at Aden, showing the number of cases of scurvy admitted into the European General Hospital at that station during the month of October 1868 from the crews of the merchant vessels in Aden Harbour, and solicit attention to the remarks of Dr. Turner, in respect to the want of vegetables and the nuwholesomeness of the meat, provisions, &c., in the ship "Compeer."

We have, &c.

sic in original.

STATEMENT showing all the Cases of SCURVY which were admitted into the EUROPEAN GENERAL HOSPITAL during the Month of October 1868.

Particulars of Ship.				Particulars of Voyage.				Date of Arrival at Aden.	Scurvy Cases on Board.		Supposed Cause of Outbreak.	REMARKS.
				Commencement of Voyage.		Last Port of Departure.						
NAME.	Official Number.	Port of Registry.	Nature of Cargo.	Port.	Date.	Name.	Date of Leaving.		Total Number.	Number sent to Hospital at Aden.		
Glendower	24,099	Liverpool -	Coal -	Liverpool -	1868: 27 May -	–	–	1868: 10 Sept. -	6	8	The usual want of fresh vegetables or substitutes; very likely the men may have been tainted before leaving, there being no medical inspection.	Potatoes were issued to the crew three times a week until the Line was reached; one ounce limejuice was issued at noon, 10 days after departure; during rough and stormy weather grog was occasionally served out; soup and bouilli once a week; accommodation good, and pretty well ventilated, and on deck. Provisions, water limejuice good.
Compeer -	42,546*	Greenock -	Coal -	Liverpool -	30 May -	–	–	18 Oct. -	10	2	Want of vegetables and good meat; long voyage, 141 days. Some of the cases may have been tainted ere leaving, there being no medical inspection.	For first 18 days potatoes were issued, also limejuice 10 days after leaving port; water pan short, and a portion of rain-water, recently caught, was mixed with the tank water. I tasted it and found it good. Accommodation for the men good, and fairly ventilated. The entire crew, including some of the officers, was tainted with scurvy. The limejuice, although labelled similar to fortified samples on board other ships, had a muddy appearance and deposit, and when filtered a very disagreeably bitter taste, but I had not material for testing as laid down. I found, on complaints made by the men, that the beef was of that called American, poor; also the pork, two casks of which I condemned; these were destroyed by order of the Political authorities. The other rations were of the usual description, though the contents of the tins of compressed vegetable were not eatable, and consequently were also destroyed. The harness cask was filled with meat in a state of decomposition; its contents were required to be thrown overboard, and cask thoroughly cleaned and deodorised; yet on visiting the ship, nearly three weeks afterwards, my orders had not been carried out. Although the limejuice was issued, care seems to have been deemed necessary in order to ensuring its being drunk by the crew.

Aden, 25 November 1868.

(signed) *J. Turner*, Surgeon Major, European General Hospital.

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* Query 48,546.

STATEMENT showing all the Cases of SCURVY which were admitted into the EUROPEAN GENERAL HOSPITAL during the Month of November 1868.

Particulars of Ship.				Particulars of Voyage.				Date of Arrival at Aden.	Scurvy Cases on Board.		Supposed Cause of Outbreak.	REMARKS.
				Commencement of Voyage.		Last Port of Departure.						
Name.	Official Number.	Port of Registry.	Nature of Cargo.	Port.	Date.	Name.	Date of Leaving.		Total Number.	Number sent to Hospital at Aden.		
Hipparchus	54,423	Cardiff*	Coal	Cardiff	1868 : 22 May	Cardiff	–	1868 : 20 Nov.	Most of the crew afflicted.	8	Length of voyage, 182 days; insufficient vegetable food; non-medical inspection.	Provisions good; medicine, medical stores, books, &c., correct; water good, limejuice good, and labelled "fortified." Men refused limejuice occasionally, because at times it was mixed with vinegar, and the sugar added was not extra, but stopped from the week's allowance. This is a statement made to me by Wm. Jackson, A. B., a patient in hospital suffering from scurvy, but denied by captain, officers, and steward, at my inspection, and were punished by two months' imprisonment for mutinous conduct. Potatoes were issued three times a week for 90 days, yet unfit for food after first month or five weeks, as stated by Wm. Jackson. No compressed vegetables nor soup and bouilli on board, save for cabin use.† So long as the crew of merchantmen are debarred vegetable matter for a long period, cases of scurvy must be expected to occur. The men forming the crew were coloured, and of American and West Indian birth. Accommodation as carved on the berths, and fairly ventilated.

* Query St. John's, New Brunswick.

† Cabin use.

Aden, 29 December 1868.

(signed) *J. Turner*, Surgeon Major.
European General Hospital.

— No. 13. —

(M. 1267.)

Seamen's Hospital Society to Board of Trade.

Seamen's Hospital Society,
86, King William-street, E.C.,
3 February 1870.

Sir,

Herewith I beg to forward to you, in continuation of former similar Returns, the statistics of "scurvy" on board the seamen's hospital-ship "Dreadnought" during the years 1868 and 1869.

The Committee of the Society have been much gratified to find that whereas in the years 1865 and 1866 they received over 100 cases per annum, the total number during last year only amounted to 40.

The reduction of numbers has been wholly confined to British shipping, as appears by the following statement.

Number of Cases of Scurvy received at the "Dreadnought:"—

In 1865,	British	101,	Foreign	1,	Total	102.
,, 1866,	,,	96,	,,	5,	,,	101.
,, 1867,	,,	90,	,,	4,	,,	94.
,, 1868,	,,	64,	,,	10,	,,	74.
,, 1869,	,,	31,	,,	9,	,,	40.

The "Dreadnought" having always been the most usual place of resort in the port of London for men suffering from this mischievous disease, the Committee consider this great reduction of numbers as affording valuable testimony to the advantage of the recent legislation on the subject.

The Secretary, Marine Department,
Board of Trade.

I am, &c.
(signed) *Kemball Cook*, Secretary.

Nominal Return of Seamen suffering from Scurvy, who have been admitted to the Seamen's Hospital Ship "Dreadnought" during the Year 1868.

Date.	NAME.	Ship.	Port of Register.	Days at Sea.	From	Quality of (as reported by Patients)			Remarks.
						Lime Juice.	Water.	Meat.	
1868:									
Jan. 2	Alex. Ramsay	Ellen Nicholson	Liverpool	–	Shanghai	—	—	—	
,, 11	Charles Meyer	Pak Wan	London	–	Foo-Choo-Foo	—	—	—	
,, 16	George Connor	Lepanto	ditto	–	Bombay	—	—	—	
,, 20	John Welsh	Lady Octavia	Greenock	120	Calcutta	Bad	Bad	Good.	
,, 25	James Newton	Ocean Express	Liverpool	130	Callao	Bad; not taken.	—	—	
,, 25	Daniel Popkis	Lindesfame	Shields	–	Berdiansk	—	—	—	
Feb. 3	William Harvey	River Dee	Liverpool	–	Calcutta	Some good, some bad	?	Bad.	
,, 17	Charles Dyer	Varima	London	125	ditto	Bad	?	—	
,, 27	William Hall	Lebanon	Shields	105	Alexandria	—	—	—	
Mar. 4	Henry Scolam	William Wilson	Liverpool	–	Columbo	—	—	—	
,, 9	James Lang	York	London	–	Calingapatam	—	—	—	
,, 9	Thomas Johnson	ditto	ditto	116	ditto	Good	?	Good.	
,, 14	Thomas Manser	Tiverton	Liverpool	116	Calcutta	Good	?	ditto.	
,, 15	Robert Holmes	Iron Crown	ditto	119	ditto	Bad	?	ditto.	
,, 15	Thomas Oliver	ditto	ditto	119	ditto	ditto	?	ditto.	
,, 15	Andrew Stephens	ditto	ditto	119	ditto	ditto	?	ditto.	
,, 15	Richard Robinson	ditto	ditto	119	ditto	ditto	?	ditto.	
,, 18	Robert Smith	Jalawar	ditto	118	Madras	Good	Good	ditto.	
,, 18	Gustaf Petersen	ditto	ditto	118	ditto	ditto	ditto	ditto.	
,, 19	Thos. M'Craith	Iron Crown	ditto	119	Calcutta	—	—	—	
,, 19	Charles Worlcott	Napoleon	London	–	Singapore	-	-	-	Mild case.
,, 20	John Marrs	Achilles	Liverpool	125	Calcutta	Pretty good	?	Good.	
Apr. 16	Henry Ponny	Calumur	ditto	113	Karachi	Bad; did not take it	Bad	Bad.	
,, 17	Robert Edmonds, O.P.	ditto	ditto	–	ditto	—	—	—	
May 18	David Parry	Brilliant	ditto	122	Japan	Taken irregularly	Good	Good.	
,, 21	Vincent Macaclay	Borgia	Manilla	–	Manilla	—	—	—	
,, 21	Silvanus Urbino	ditto	ditto	–	ditto	—	—	—	
July 22	J. Donovan	Rock City	Hartlepool	–	Alexandria	None	—	—	
,, 23	Frederic Andersen	Jesse Isabelle	London	–	Columbo	-	-	-	Syphilis.
Aug. 4	James M'Donald	Margaret Pugh	Liverpool	165	Rangoon	Good	Good	Good.	
,, 8	William Phillips	Caroline Hutchins	London	–	Calcutta	—	—	—	
,, 12	John Newton	Spirit of the North	ditto	–	Manilla	—	—	—	
,, 13	Robert Campbell, O.P.	Lancashire Witch	Leith	–	Cochin	—	—	—	
,, 15	Hans Paulsen	Bravo	Bremen	–	Quebec	—	—	—	
,, 15	Charles Bennett	Thomas Wood	Sunderland	–	Columbo	—	—	—	
,, 17	Hans Lange	A. E. Vidar	Hamburgh	–	Batavia	—	—	—	

SEAMEN admitted into the "Dreadnought" Hospital Ship with Scurvy during the Year 1868—*continued.*

Date.	NAME.	SHIP.	Port of Register.	Days at Sea.	From	Quality of (as reported by Patients) Lime Juice.	Water.	Meat.	REMARKS.
1868:									
Sept. 4	Benjamin Bolt	Crusader	London	–	Calcutta.	—	—	—	
„ 10	Samuel Lahti	Calvaro	Brahestad	–	Willenberg.	—	—	—	
„ 7	H. Gould O.P.	Spindrift	Glasgow	–	Foo Chow.	—	—	—	
„ 21	A. Johnson O.P.	Sea Wave	London	–	Cochin.	—	—	—	
„ 24	Thomas Murphy	Waverley	Liverpool	–	Calcutta.	—	—	—	
Oct. 17	Joseph Miller	Forward Ho!	Aberdeen	125	Shanghai	Good	Good	Good.	
„ 23	John Pauell	Eliza Shaw	London	–	Shanghai	Good	?	?	
„ 25	Bernard Bergensen	Mindora	Liverpool	161	Calcutta	Good; given out weekly.	?	Good	Board of Trade inquiry.
„ 25	James Parker	ditto	ditto	161	ditto	Bad; taken irregularly.	?	Good.	
„ 25	Andrew Larsen	ditto	ditto	161	ditto	Ditto	?	Good.	
„ 27	William Evans	Somerset	London	131	ditto.	—	—	—	
„ 27	Andrew Christie	ditto	ditto	131	ditto.	—	—	—	
„ 27	William Wilkie	ditto	ditto	131	ditto.	—	—	—	
„ 27	James Rose	ditto	ditto	131	ditto.	—	—	—	
„ 27	Charles Neely	ditto	ditto	131	ditto.	—	—	—	
„ 27	John Ireland	ditto	ditto	131	ditto.	—	—	—	
„ 27	Andrew Robertson	ditto	ditto	131	ditto.	—	—	—	
„ 28	Norman Duncan	Hindostan	Liverpool	122	ditto	Given out weekly; taken irregularly.	?	?	
„ 30	George Parker	Warwick	London	120	ditto	Bad; taken irregularly.	?	Good.	
„ 30	Jas. Stratford O.P.	ditto	ditto	120	ditto	ditto	?	Good.	
„ 31	Joseph Pallas	Silvia	Liverpool	162	ditto	Good	?	Bad.	
Nov. 2	R. Davidson	Rowena	Aberdeen	150	Bombay	Not taken	Good	Not taken.	
„ 7	David Irving	Hampton Court	London	165	Akyab	Good	Rain	Good.	
„ 21	John Christiansen	Broussa	Liverpool	127	Calcutta	?	?	?	
„ 24	Thomas McLean	Mary Tuck	London	–	Tuticorin.	—	—	—	
„ 24	William Wallis	Henry Read	London	–	Calcutta.	-	-	-	Dysentery.
„ 26	William Wigg	Earl Dalhousie	Dundee	–	Shanghai.	—	—	—	
„ 26	Jas. Shackles	Silver Eagle	London	–	Foo Chow.	—	—	—	
„ 27	August Packman	Tahti	Vasa	98	Odessa	None.	—	—	
„ 27	Emil Zodenberg	ditto	ditto	98	ditto.	—	—	—	
„ 27	Franz Nelsen	ditto	ditto	98	ditto.	—	—	—	
„ 28	Emil Dalhstrom	ditto	ditto	–	ditto	None.	—	—	
Dec. 1	John Brooks	Devonshire	Liverpool	–	Callao.	—	—	—	
„ 10	Hans Hansen	Ernest and Marie	Bremen	–	Shanghai.	—	—	—	
„ 19	Richard Wilson	Warwick	London	–	Calcutta.	—	—	—	
„ 20	James Nicholls	Northampton	ditto	–	Shanghai.	—	—	—	
„ 21	Alexander Blake	Pilgrim	Salcombe	–	Montserrat.	—	—	—	
„ 30	Andrew Larsen	Northampton	London	–	Shanghai.	—	—	—	

SUMMARY.

Foreign	10
London	27
Liverpool	26
Salcombe	1
Dundee	1
Shields	2
Greenock	1
Glasgow	1
Sunderland	1
Hartlepool	1
Aberdeen	2
Leith	1
	74

NOMINAL RETURN of SEAMEN suffering from Scurvy, who have been admitted to the Seamen's Hospital Ship "Dreadnought" during the Year 1869.

Date.	NAME.	SHIP.	Port of Register.	Days at Sea.	From	Quality of (as reported by Patients)			REMARKS.
						Lime Juice.	Water.	Meat.	
1869: Jan. 2	Herbert Haunch	Oriana	Greenock	119	Calcutta	Good; taken regularly.	?	?	
" 2	Thomas Brew	Regina	London	80	Jamaica	Given out weekly.	Good	Good.	
" 7	William Adams	Oriana	Greenock	–	Calcutta	Good	?	?	
" 9	William Roberts	ditto	ditto	–	ditto.	—	—	—	
" 18	William Marley	Cœur de Lion	Jersey	110	Coconado	Given out weekly; taken irregularly.	?	Good.	
" 21	John Swanson	ditto	ditto	110	ditto	Ditto	?	Good.	
" 25	Silas Green	Surrey	London	–	Calcutta	Good; given out daily.	?	Good.	
" 26	Robert Goodman	Western Chief	Plymouth	–	Shanghai.	—	—	—	
Feb. 2	Dennis Dockerty	Cumberland	London	132	Calcutta	? Taken regularly; given out daily.	?	Good.	
" 15	George Armstrong	Island Queen	Boston	111	ditto	Good	- -	Some bad.	
" 17	Francis Sanders	Sir H. Lawrence	Liverpool	–	ditto.	—	—	—	
" 20	James Doux	Challenge	Greenock	130	ditto	Very bad; Calcutta.	?	Beef bad; pork good.	
Mar. 17	John Peters	Oliver Cromwell	Liverpool	–	Rangoon.	—	—	—	
Apr. 2	James Benson	Baringe	ditto	154	Madras	- ? -	Good	Good.	
May 22	Herman Skilling	St. Hilda	London	–	ditto.	—	—	—	
" 22	Henri Scheffer	Zupdenhia	Dantzic	–	Alexandria.	—	—	—	
" 24	William - O. P.	St. Hilda	London.	–	—	—	—	—	
June 14	George Gould	Morning Light	Liverpool	–	Callao.	—	—	—	
" 25	William McMillan	L. R. C.	London	–	Java.	—	—	—	
July 8	T. McGilligan	Yeavering Bell	Shields	–	Cochin	- ? -	Good	Good.	
" 22	John Richards	Fanny Gilbert	New York	–	New Orleans	None	Good	Good.	
Aug. 7	Alexander Hamilton	Robinson Crusoe	Liverpool	–	Bombay.	—	—	—	
Sept. 3	James Clarke	Mangalore	ditto	156	Calcutta	Would not take the juice.	—	—	
" 9	Gustif Johnson	Methelda	Copenhagen	90	Minititla	- - -	Bad.	—	
" 10	William Hildove, O.P.	Lady Lawrence	Liverpool	–	Calcutta.	—	—	—	
" 20	Peter Harbeck	Thurse	Hamburgh	170	Moulmein	- ? -	Good	Good.	
" 21	George Bechard	Jubilee	Guernsey.	–	—	—	—	—	
Oct. 16	Patrick Ormond	Sokar	London	140	Calcutta	Good; weekly	?	Good.	
" 19	Joseph Wilson	City of Cashmere	Glasgow	106	ditto	Weekly.	—	—	
" 21	Peter Tolaksen	Cosenos	Arundel	–	Finland	None.	—	—	
" 27	Matt. Wingeet	Equator	Jacobstadt	34	Quebec	None.	—	—	
" 30	Andrew Smith	Ottoman Empire	Liverpool	180	Akyab	- - -	- -	-	
Nov. 21	Charles Brown	Benefactress	ditto	–	Bombay.	—	—	—	Short of provisions, sec. syphilis.
" 23	Thomas Allmack	Queen of Denmark.	—	–	—	—	—	—	
" 24	William Kelly	Clytemnestra	Liverpool	–	—	—	—	—	
Dec. 4	Soph. Callisen	Star of China	Aberdeen	–	Shanghai.	—	—	—	
" 15	Antonio Alves	Venice	Lisbon	58	Lagos.	—	—	—	
" 15	Joaquim da Sonza	ditto	ditto	58	ditto.	—	—	—	
" 15	Francis Doaite	ditto	ditto	58	ditto.	—	—	—	
" 15	Manuel de Soares	ditto	ditto	58	ditto.	—	—	—	

SUMMARY.

Foreign	9
British	31
London	7
Liverpool	10
Greenock	4
Glasgow	1
Aberdeen	1
Jersey	2
Guernsey	1
Shields	1
Plymouth	1
Arundel	1
Boston (? United States)	1
(?)	1
	31

— No. 14. —

(M. 887.)

Her Majesty's Consul, Callao, to Board of Trade.

British Consulate, Callao,
20 December 1870.

Sir,

I have the honour to enclose copies of a correspondence which has taken place between myself and Señor Soroa, President of the Benevolent Society, having charge of the hospital of this place, on the subject of the diet of sick seamen in that establishment, the result of which will, I trust, prove beneficial to the patients.

The remarks in Señor Soroa's note as to scurvy being very prevalent in, whilst almost entirely confined to, British ships, is, I regret to say, but too true, only one foreign scurvy ship having been known to arrive here within the last seven years, whereas the number of those under the British flag has been very large.

From the frequent reports which it has been my duty to forward to you on this subject within the last two years of my residence here, it appears evident that whether the present law and published regulations are complied with or neglected, scurvy will continue to develope itself on long voyages where a sufficient supply of antiscorbutic food is not supplied to the crews, in addition, or I might even say from the example of foreign ships in lieu of lime juice.

Lime juice is not in general use in any but British ships; and even when issued without restriction, has failed of itself either to avert or arrest scurvy, and this circumstance has very reasonably been attributed by Dr. Roe and others to the absence of nourishing qualities in this antiscorbutic. It would at all events be well to make the experiment of some other antiscorbutic possessing such qualities; and seeing that masters and owners of ships will not in all cases do this of their own accord, from a mistaken sentiment of economy, the 4th section of the Merchant Shipping Act, 1867, might with advantage be forced with regard to ships making long voyages, and especially to those proceeding to Aden.

The various cases that have come under my notice have tended to prove that potatoes constitute the best possible antiscorbutic food, and the fact that they can be cheaply preserved and rendered available for the longest voyages by packing them in molasses in the manner explained in the Report enclosed in my Despatch, No. 5, of the 10th of March 1869, establishes a simple and efficient mode of preventing the ravages of a most dreadful malady, and of dispelling the present well-founded charge of its prevalence being so general in, and at the same time exclusively confined to, the British mercantile marine.

I have, &c.
(signed) *C. A. Henderson.*

The Assistant Secretary,
Marine Department, Board of Trade.

Enclosure 1, in No. 14.

Sir, British Consulate, Callao, 19 November 1870.

Referring to the conversation we had a short time since, when you were good enough to acquiesce in my instructing Dr. Roe to inquire into some complaints of seamen in regard to the food supplied to them in the hospital, I have now the honour to enclose to you Dr. Roe's Report of this inquiry.

From this Report you will perceive that Dr. Roe bears testimony to the good quality and ample quantity of the food supplied.

His remarks regarding the peculiar nature of the cases of seamen, as compared with those of the ordinary run of patients entering the hospital, and his suggestions as to the nature of the diet which would be most conducive to restore them to health, are based on his long experience of the treatment of seamen, and will, I am confident, meet with the favourable consideration of the directors of the society, so worthily presided over by yourself.

I have, &c.
(signed) *C. A. Henderson.*

Señor Don Joaquin Soroa,
President of the Benevolent Society, Callao.

Enclosure 2, in No. 14.

Sir, Callao, 10 November 1870.

In compliance with your instructions that I should visit the hospital daily at meal hours, and that I should report to you the result of my observations as to the quality of the food supplied to the patients, and whether certain complaints made by the patients had any foundation,—

I beg to inform you that during the last week I have visited the hospital at meal hours. I have examined the nature, the quantity, and the quality of the food supplied to the sick, and I have inquired amongst those now in hospital as to what objections they might offer to their food.

The food supplied is of good quality, and the quantity is ample, the men having, in fact, as much as they may wish to eat; and there is no ground of complaint under either of these heads. The complaints of the seamen appear to arise from the monotony of the diet, and we may be sure that some unsatisfied want of the system is at the bottom of their discontent.

When they have been in hospital for some time they lose their appetites and cannot eat their food, although there is no doubt that the food is excellent of its kind.

Breakfast is served at 9 a.m., and consists of soup, bread, meat, rice, and generally a small quantity of vegetable; dinner is served at 3 p.m., and is exactly the same as the breakfast. At breakfast and dinner the men get a cup of tea. No meal is provided from 3 p.m. until nine the next morning, but in the evenings a cup of barley or rice water with sugar is given.

A civil hospital is usually called on to treat acute cases of disease. Sick people on shore generally seek the hospital when they are very ill, and as soon as their more urgent symptoms are relieved they leave the hospital to re-establish health and strength elsewhere. The diseases of seamen, on the contrary, are commonly diseases of debility resulting from, or aggravated by, bad and insufficient food; and, moreover, they seek to have their health and strength re-established in the hospital, and to be fitted to earn their bread in their arduous calling immediately they leave the establishment.

The food of seamen, therefore, when they are patients in the hospital should be different from that of the ordinary patients; and as nearly all the seamen who visit this port arrive here after long voyages and are commonly afflicted by scurvy or allied diseases, a diet of fresh vegetable food would be indicated as the most appropriate to meet their cases.

I would suggest, therefore, that instead of the large quantity of meat which is supplied for the breakfast, a much smaller quantity be provided, together with a liberal allowance of lettuces and watercresses, which are here very cheap and abundant, and can be had all the year round. The bread and tea might be cut off from the dinner, but potatoes, which are a powerful antiscorbutic, should be added, and in special cases a little fruit. I would suggest that a third meal be provided for the evenings, which might consist simply of bread and tea.

I feel convinced that should the hospital authorities adopt the suggestions I have indicated above, a very great economy would result to the establishment from the more rapid cure of the sick seamen.

I am, &c.
(signed) *Thos. A. Roe*, M.D.,
Consular Medical Officer.

C. A. Henderson, Esq.,
Her Majesty's Consul at Callao.

Enclosure 3, in No. 14.

Republica Peruana.

Direccion de Beneficencia.

Señor, Callao, 1 de Diciembre 1870.

He recibido su apreciable nota como igualm^{te} los informes del Dr. Roe respecto a la dieta que se dá a los enfermos en el Hospital.

Considera la Junta de Beneficencia que presido, que los pedidos que contiene el informe del Dr. Roe son razonables, y ha dado en consecuencia ordenes para que se Ueven al cabo en todo aquello que pueda practicarse.

Hay una gran verdad en las observaciones del Dr. Roe respecto a la naturaleza de las enfermedades que sufren los Hombres de Mar, y tiene razon en decir que casi todos los marineros que se reciben de los Bugues ingleses sufren de escorbuto ó parecidas enfermedades, le hau recebido en el Hospital en varios ocasiones casi. Tripulaciones enteras de Bugues que hau estado en una condicion deplorable de esta terrible enfermedad.

El Hospital de Beneficencia tiene que Uenar muchas Exijencias y deberes, y en tanto que con le Mayor caridad y bondad atiende a los reclamos, mejorando su servicio, descaria que por el énterés del Hospital, como igualm^{te} por el de la humanidad, representase V. a su Gobierno que los unicos Buques (con pocas excepciones) que traen el escorbuto a nuestras costas son Ingleses.

Aprovecho, &c.
(signed) *J. Soroa.*

Señor Consul de S. M. B^{a} en este Puerto.

(Translation.)

REPUBLIC of PERU.

Benevolent Society's Office, Callao,
1 December 1870.

Sir,

I HAVE received your esteemed note, together with the Report made by Dr. Roe in regard to the diet supplied to patients in the hospital.

The directors of the benevolent society, of which I am president, consider that the requests contained in Dr. Roe's Report are reasonable, and they have consequently ordered them to be complied with as far as may be practicable.

There is much truth in Dr. Roe's remarks as to the nature of the diseases of seamen, and he is right in stating that almost all seamen received from British ships are affected with scurvy or allied maladies.

Almost entire crews, in a deplorable condition from this dreadful malady, have on various occasions been received into the hospital.

The benevolent society's hospital is required to comply with many demands and to fulfil many duties; and whilst I may say that it does so, and seeks to improve its service, from the most charitable and benevolent motives, I would wish, not only in the interests of the hospital, but in the cause of humanity, that you would represent to your Government that the only ships (with but few exceptions) which bring scurvy to our coast are English.

I avail, &c.
(signed) *J. Soroa.*

H. B. M. Consul, Callao.

— No. 15. —

(M. 670.)

Admiralty to Board of Trade.

Admiralty, 21 January 1871.

Sir,

I AM commanded by my Lords Commissioners of the Admiralty to transmit to you herewith an extract from the journal of the medical officers in charge of the detachment of Royal Marines at the Falkland Islands respecting scurvy among the crews of merchant ships at that place, and I am to acquaint you that a more detailed report has been called for.

I am, &c.
(signed) *Vernon Lushington.*

The Assistant Secretary,
Marine Departmemt, Board of Trade,

Enclosure in No. 15.

EXTRACT from the Journal of the Medical Officer in charge of the Detachment of Royal Marines at the Falkland Islands.

AMONGST the merchant ships during the month of August 1870, and the early part of September, numerous cases of incipient scurvy were under treatment, and if they had remained much longer at sea several of them would have had a fatal termination. This disease has been more prevalent at the Falklands during the last few years, and the ships in which it appears most are either from Swansea or Liverpool.

— No. 16. —

(M. 670.)

Board of Trade to Admiralty.

Board of Trade, Whitehall,
26 January 1871.

Sir,

I AM directed by the Board of Trade to acknowledge the receipt of your letter of the 21st instant* (L.M.M.), enclosing an extract from the journal of the medical officer in charge of the detachment of Royal Marines at the Falkland Islands, respecting cases of scurvy among the crews of merchant ships at that place.

The Board will be glad to receive the more detailed report which has been called for by the Lords Commissioners.

I have, &c.
(signed) *Thomas Gray.*

The Secretary, Admiralty.

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* See *ante* No. 15.

— No. 17. —

(M. 4166.)

India Office to Board of Trade.

Sir, India Office, 5 May 1871.

Gaol and gaol discipline in 1867–68.
Reports on the nature of food of the inhabitants of the Madras Presidency, &c. &c., 1863.
Prison Administration, British Burma, 1869.
Gaols of the Lower Provinces, 1860.
Report on Gaols of the North West Provinces, 1869.
Punjab Gaol Report, 1869.
Oudh Gaols Report, 1869.
Central Provinces Gaols Report, 1869.
Madras Gaols Report, 1859–60.
Report on the diet of prisoners, and the industrial and labouring classes, Bombay, 1865.

In accordance with the request contained in your letter dated 13th instant, that the Duke of Argyll would cause the Board of Trade to be furnished with the scale of rations served out in Indian gaols generally, and the scale in use at Bombay in particular, for the information of the Inspector appointed by the Board to inquire into the circumstances attending an outbreak of scurvy on board the "Maria Hay," I am directed by the Secretary of State in Council to forward to you copies of the several reports noted in the margin; and with regard to the desire of the Board to be specially furnished with the scale of rations served out in the Bombay Presidency, I have to inform you that this Office does not possess any separate papers on the subject of a later date than the "Report on the Diet of Prisoners, and of the Industrial and Labouring Classes of the Bombay Presidency," which was compiled in 1865, and which forms a portion of the documents herewith forwarded.

I have to request that when no longer required these several reports may be returned to the Record Department of this Office.

I am, &c.
(signed) *Herman Merivale.*

The Assistant Secretary, Marine Department,
Board of Trade.

— No. 18. —

(M. 4166.)

Board of Trade to *Harry Leach,* Esq.

Sir, Board of Trade, Whitehall, 9 May 1871.

In compliance with your request, I am directed by the Board of Trade to transmit to you a copy of a letter from the Secretary of State for India enclosing various reports upon the scale of rations served out in Indian gaols.

I am, &c.
(signed) *Thomas Gray.*

Harry Leach, Esq.,
Seamen's Hospital, Greenwich.

PART II.

RESULTS of any Inquiries Ordered by the BOARD of TRADE in cases where SCURVY has been known to exist on board Ship.

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— No. 1. —

(M. 3674—1867.)

"DIANA."

"Diana."

The Superintendent of the Mercantile Marine Office at Lerwick on the 13th April having reported that 11 deaths had occurred on board the whaling vessel "Diana" from scurvy, Mr. Gatherer was appointed inspector, and the following is his report thereon :—

(M. 3122.)

"Deaths from Scurvy on board of the 'Diana' at Davis Straits, bound to Hull.

"Sir, "Custom House, Lerwick, 25 April 1867.

"I beg respectfully to report that your telegram, your letter, and the appointment as inspector by the Board of Trade, relative to the above, and all dated the 13th instant, were only received here on the 22nd instant by the weekly mail steamer. The newspaper extracts attached to your letter are herewith returned. Taking advantage of a fair wind the 'Diana' sailed from Lerwick Sound for Hull the day I received your instructions, and I regret I was unable to prepare and transmit this my report with the mail steamer departing hence the same day.

"In my report (as Superintendent Mercantile Marine Office) dated the 13th instant, No. 13, accompanying Form K., 'Particulars of Deaths on board a foreign vessel,' I so far anticipated the report required by your present order, and little therefore remains to be added to my former statement. I explained in the report referred to (a copy of which is annexed) that the vessel first arrived at Rona's Voe, an out-station about 50 miles from Lerwick; the vessel was afterwards brought to Lerwick by seamen engaged for the purpose; the seamen belonging to Shetland, and engaged last year at this port all left for, or were removed to, their homes throughout the islands, either from Rona's Voe, or on the vessel's arrival at Lerwick. The English portion of the crew, including the surgeon, who were originally shipped at Hull, were forwarded last week to that port. As stated above, the vessel has sailed for Hull, her final port of discharge, manned by a fresh crew, and commanded by a new master. No more of the crew have died since the date of my last report.

"Acting under your instructions and appointment, I went on board of and inspected the vessel shortly before she sailed; I was accompanied by a medical gentlemen, resident in Lerwick; we found a seamen on board who had been with the vessel, viz., William Reynolds, harpooneer, and now acting as mate. I annex a narrative of the disastrous voyage which appeared in the 'Scotsman,' an Edinburgh newspaper, and on which the writer of the article extracted from the 'Daily Telegraph,' forwarded by you, seems to have founded his remarks. On questioning Reynolds, I ascertained that he was the seaman who furnished the newspaper correspondent with the narrative which he (Reynolds) on being shown, stated was substantially correct. It may serve in place of his deposition, which the sailing of the vessel did not admit of my taking. Reynolds further informed me that when the 'Diana' left Hull, in February 1866, for the double voyage (first to the sealing at Greenland, and afterwards to the whaling at Davis' Straits), the vessel was fully provisioned for a nine months' voyage. It may here be necessary to explain that (excepting a few wintering at stations, vessels seldom remain out so long, and never beyond that number of months, unless when beset in the ice, a casualty which rarely occurs, the last similar occurrence happening in 1836-37. Reynolds considered the provisions and stores as good in quality, and sufficient in quantity for the double voyage; he had no fault to find with the sleeping or berthing accommodation on board, considers it as good as that usually provided in a similar class of vessels; stated that none of the crew ever complained in any of these respects, and from all I have heard I have no reason to doubt his statement; further stated, as his opinion, that if the vessel had not got froze up, but had returned to the United Kingdom

"Diana."

Kingdom as was intended with the other vessels in the Autumn of 1866, the crew would have been exempt from sickness, and would have had surplus provisions and stores on board when the voyage terminated. The fact that some salted pork and biscuit remained unconsumed even after wintering, substantiates the accuracy of this part of the seamen's statement; we saw none of the old provisions on board; the quality of such provisions, it may be observed, seldom deteriorates in such a climate. I beg here to observe that I understand the owners of some of the whaling vessels take the precaution of provisioning their vessels for the possible compulsory detention in the ice all winter, such a prudent arrangement is however necessarily attended with great additional outlay. Reynolds further stated that when the vessel cleared at Hull there were a cask and jar on board containing, he estimated, about 26 gallons of lime-juice; the greater part of this lime juice was served out to the crew during the whaling voyage, the remainder, though sparingly served out—often the vessel was beset—only lasted during a portion of the winter; no sample of the lime-juice remained on board. I beg to call attention to the circumstance that vessels employed in the Northern Whale Fisheries are, by the terms of the 224th section of the 'Merchant Shipping Act, 1854,' exempted from keeping on board for the use of the crews lime or lemon juice, or other anti-scorbutics. These vessels, nevertheless, are generally so provided, though to a small, and to an extent insufficient, for such an exceptional case as the present. The time occupied going to, and returning from Davis' Straits, is about the same as a North American voyage, but the duration of the voyage, from the time occupied in the whaling, is far longer than that of vessels sailing to parts south of the 35th degree of North latitude. It might be a matter for consideration if it might not be expedient to render the carrying of anti-scorbutics by northern whale-fishing vessels compulsory when it is found that many of the masters already see the propriety of voluntarily doing so. The medical gentleman, and I, also met Lawrence Stewart, a Shetland seaman, who served as harpooner on board the 'Diana,' and who has had many years' experience in the same trade; he confirmed Reynolds's statements, attributing the sufferings of the crew to the accidental and unlooked for detention of the vessel in the ice, a contingency for which the vessel was neither provisioned or otherwise prepared; this opinion agrees with all I have otherwise heard or learned about the matter.

"I hope it may not be considered out of place to bring under your notice the truly brave and devoted conduct of the surgeon (Charles Edward Smith) who was on board. I understand that the crew are unanimous in attributing their safety to his unremitting kindness, and his exertions on their behalf; beyond his endeavours to preserve their health, and lessen their privations, he performed all the menial duties of a nurse to the sick and dying when their comrades could not, or would not, afford them such aid, as they lay in what ultimately became a sickening and indescribable scene of filth and impurity. Any public recognition of his conduct by the bestowal of a medal would not only be well deserved, but I am sure would give general satisfaction to all conversant with his services, or interested in the vessel and crew.

"I will show the medical gentleman, who joined me in the inquiry, the preceding statement and observations, and relative documents: and will request his report as to the more proximate cause or causes of the disease and deaths on board the vessel. I will transmit his account herewith.

"Respectfully submitted,

(signed) "*John Gatherer*,
"Collector of Customs, acting as Inspector.

"The Assistant Secretary,
"Marine Department, Board of Trade,
"Whitehall, S.W."

"Bertha Marion."

— No. 2. —

(M. 1691.)

"BERTHA MARION."

The superintendent at Liverpool, on the 15th February, reported the arrival of the "Bertha Marion," with her crew suffering somewhat severely from scurvy.

Commander Prior, R.N., and Dr. C. A. Holcombe, Government emigration officers at Liverpool, were appointed by the Board of Trade, as inspectors, to inquire into the circumstances.

The following is their Report:—

"Government Emigration Office,
"Sir, "Liverpool, 25 February 1867.

"In compliance with the request made by the Board of Trade in your letter of the 18th instant, No. M. 1379, we beg to state that we went on board the 'Bertha Marion' and found that the crew occupied a house on deck, and that the space allotted to the men exceeded the scale prescribed by the Act of Parliament, but that the ventilation depended upon a skylight and the entrance door being open.

"We afterwards examined the master, mate, carpenter, and four men, who had been affected with scurvy.

"The evidence of the master, Mr. George Ager, and the mate, Mr. Tooze, shows that the ship left this port on the 29th March 1866, bound for Arica with a general cargo, and a crew of 16 men, all apparently healthy, and victualled for a 10 months' voyage. Soon after arriving at Arica four of the crew deserted, and their places were supplied by two ordinary seamen, one shipped at Arica, the other at Islay. After remaining at Arica about five weeks they sailed for Islay, where they stopped 15 days; they next proceeded to Iquique, where they were four days, thence to Mexillones, where they remained 12 days, then returned to Islay for 10 days, and afterwards sailed for Liverpool, arriving here on the 7th instant. They also stated, that although the steward had orders to serve out the vinegar and lime-juice, they did not know whether the men had it; that potatoes were given to the crew, at first, twice a week; afterwards, once a week, from the time they left Liverpool to the Equator, and that upon the return voyage, soup and bouilli were also given twice a week, and afterwards once a week, and that the cargo consisted of horns, dry hides, wool, barrilla, and nitrate of soda. It appears too that there was no sickness until the 7th January last, when Gustav Hilbron was attacked with scurvy, and between this date and the 7th February, when the ship arrived at this port, it had extended to five other men.

"The evidence of the men goes to prove that the provisions shipped from Liverpool were all good excepting the tea and coffee, but that some of the provisions procured on the coast were very bad; that in the way of medical stores there was a deficiency of arrow-root, pearl barley, and rice, for Farrill only had arrow-root given him three or four times, with three or four glasses of wine; that the vinegar and lime juice were given to the men in bottles, which they had replenished by the steward when they asked for them, but as the men did not like the lime-juice very little was taken. Gustav Hilbron stated, that during the whole voyage he was sure he did not drink a pint, and Joseph Obent stated that he did not take any until he was sick, that is nine days before returning to this port. Although there was plenty of shore water on board, from Cape Horn to the Western Islands, the captain made them drink rain water. That owing to the ship being heavy laden she pitched so much that the house on deck was constantly wet, but that they had no complaint to make, excepting that the tea and coffee were bad, and being, as they considered, unnecessarily obliged to drink rain water. They attribute the sickness to the bad provisions on the coast, the wet house, and the drinking of rain water.

"From the evidence adduced we have come to the conclusion that the nitrate of soda had nothing to do in causing the scurvy, and although the house on deck could

"Bertha Marion."

could not have been otherwise than detrimental to the health of the crew, nevertheless we consider that the scurvy was mainly owing to the men not taking the lime-juice, and that the provisions of the Merchant Seaman's Act were not complied with, inasmuch as the vinegar and lime-juice, instead of being issued daily, were given occasionally, and that there was a deficiency among the medical stores of arrow-root, pearl barley, and rice.

"In conclusion, we beg to add that we consider this is one of those cases which shows the necessity of the seamen being compelled to drink their lime-juice, and that in all ships making these long voyages, preserved soup, bouilli, and vegetables ought to form a part of their dietary scale.

"We have, &c.
(signed) "*F. H. Prior*,
"Commander, R.N.

"Chief Emigration Officer,
"*Chas. Alexr. Holcombe*, M.D.

"The Secretary, Board of Trade."

— No. 3. —

(M. 7193.)

"RIVERSDALE."

"Riverdale."

THE Seamen's Hospital Society reported on the 27th September having received on board the "Dreadnought" six cases of scurvy from the "Riversdale."

Dr. Dickson and Mr. J. O. P. Stuart were appointed inspectors.

The following is their Report, a copy of which was sent to Mr. Macintyre, the owner of the "Riversdale," whose reply is also here given.

"Sir, "London, 3 October 1867.

"WE have the honour to report, for the information of the Board of Trade, that in compliance with the instructions contained in Mr. Gray's letter, M. 7041 of the 30th ultimo, we have inquired into the breaking out of scurvy on board the 'Riversdale.'

"We have ascertained from official documents that the 'Riversdale' belongs to the port of Liverpool, is of 1,490 tons register, built with a framework of iron and planking of wood; has top-gallant forecastle and round-house for crew, of 47 $\frac{48}{100}$ tons, and is the property of Mr. Lewis Henry Macintyre, merchant, Liverpool, and others.

"She left London on the 12th November 1866, with a crew of 33 hands (all told), on a voyage to Calcutta, and arrived there on the 3rd March 1867, remaining in port until the 3rd June, when she sailed for London, sighted the Cape of Good Hope on the 3rd August, and arrived in the Victoria Docks on the 26th ultimo. Thirteen of the crew appear to have been discharged at Calcutta by mutual consent, and one who is reported in the official log-book to have been suffering from venereal disease, and off duty 49 days, was also discharged there.

"Fourteen men from the shore were engaged as substitutes. Nine of these had only six days before left the 'Clydesdale,' of London, 1,354 tons, in which they had made the outward voyage, and six of this number are now patients on board the hospital ship 'Dreadnought,' suffering from scurvy.

"The crew of the 'Riversdale' appear to have had good health during the passage to Calcutta, and also during her stay of three months in harbour.

"Two men affected with fever were sent to hospital, but rejoined the ship before she sailed.

"With the exception of the outbreak of scurvy affecting the six men from the 'Clydesdale,' as stated above, the crew appear to have enjoyed good health during the homeward passage. The first entry in the official log-book of illness

from

"Riversdale."

from scurvy occurred on the 23rd August in latitude 2° 45 S./ Longitude 18° 38′ W., and in the next four weeks five others were disabled from duty through the same cause.

"On the 1st instant we visited the ship in dock, but found no responsible officer on board. On the 2nd instant we again visited her and saw the master, Mr. Robert Carter, and inspected the vessel and such of the provisions as still remained.

"These consisted of beef, pork, biscuit, and sugar, and we were informed that they were of the same quality as had been supplied to the crew during the voyage.

"The samples were all in good condition.

"The water was also tasted by us, and found to be good; it had been drawn from alongside when the ship was lying in the Hooghly, but had undergone a filtration through sand and charcoal before being stored in iron tanks.

"The provisions had been supplied by Messrs. Yates & Son, of 3, Lower East Smithfield, London, with the exception of the beef which came in the ship from Liverpool, and is believed to have been procured of Messrs. Southern & Robinson, of that port.

"The stores were amply sufficient for the voyage, nothing having run short, with the exception of sugar, which had been replaced at Calcutta. Vinegar had been served out regularly.

"No lime-juice remained on board. Twenty gallons in a cask had been obtained from Messrs. Yates & Son, of London; besides this about 16 gallons were on board when the master joined; the latter quantity had been bottled off, and served out to the crew on the outward voyage. It was not until the ship was some way on her voyage home, that they began to use the lime-juice from the cask, but it appears to have been of bad quality, or at least to have deteriorated so much by exposure to a warm climate as to become undrinkable, and was therefore after a short time discontinued and the remains thrown away. In lieu of lime-juice, the master had issued to the crew spirits (rum and gin), and on alternate days claret in small quantities. Spirits did not form a part of the regular allowance of the ship.

"No preserved provisions appear to have been issued, but on the outward passage fresh potatoes were served out to all hands every day for a month, and afterwards once or twice a week while they lasted.

"In harbour the men were fed on fresh meat and vegetables obtained daily from the shore.

"We inspected the accommodation for the men, and found it to be amply sufficient; it consisted of two roomy deck-houses and a spacious top-gallant forecastle, in two compartments, fitted with comfortable bunks, light, and well ventilated.

William Whelpley.
Michael Handrahan.
John Williams.
George Stapleton.
James Facio.
John Donaldson.

"From the 'Riversdale' we proceeded on board the 'Dreadnought,' and saw the six seamen whose names are mentioned in the margin. We found them all to be suffering from scurvy in a well marked form. Their evidence was confirmatory of what has been stated above; they were all in good health at the time they joined the ship at Calcutta, and had no previous illness while going out in the 'Clydesdale;' they all stated that on board that vessel they had been well fed and cared for, having a mess of fresh or preserved provisions once a-week. Soon after rounding the Cape of Good Hope, on the passage home, some of them began to suffer from debility and incipient symptoms of scurvy, but it was not until they were near the Equator that the first was compelled to relinquish his duty, and soon afterwards the others had to follow.

"The provisions were stated by them to have been of good quality, with the exception of the beef, one cask of which, in particular, is alleged to have been very bad, and to have been previously condemned on the voyage out.

"The lime-juice is also stated to have been of inferior quality, and to have become so thick and unpalatable that after a time they refrained from drinking it.

"They all bore testimony to the care that had been taken by the master to relieve them, as far as practicable, during sickness, and to supply them with such comforts as he had at his disposal.

"From the evidence adduced there seems to be little doubt that in this case the outbreak of scurvy, which was confined to such of the crew as had made two long

"Riversdale."

long oceanic voyages (with the interval of only six days), was owing to that circumstance, and to the consequent privation of fresh vegetable food for nearly eight months.

"The seamen affected had not the same advantage as those who were in the 'Riversdale' the whole voyage, of a potato diet on the passage out, and in having fresh provisions for three months in harbour.

"But it is probable they might have escaped the severity of the disease if there had been good lime-juice, either as a preventive or cure. Instead of this, the quality of that supplied in the latter part of the voyage is admitted to have been very bad.

"As no remains have been submitted to us, we are unable to state whether it was inferior from the beginning, or had become spoiled by nine months' exposure to a warm climate.

"The vender, Mr. Yates, whom we have seen, expresses his conviction of its original purity, having been obtained by him from Messrs. W. & C. Volckman, of Bishopsgate-street, who manufacture the article only from the fresh fruit; but no spirits had been added, so as to preserve it, and it was stored in the usual thoughtless and wasteful manner in a large cask. With the exception of one cask of beef, with regard to the quality of which there is much discrepancy in the evidence, the provisions appear to have been good.

"The only point in which the requirements of the Act do not seem to have been complied with is, that the master, when aware of the faulty character of the lime-juice, did not procure a fresh supply at the Cape of Good Hope, or St. Helena.

"From the fact of scurvy being limited to one section of the crew, it is clear that their stay in port (six days) was too short to ensure them from great risk of the disease, with the ordinary precautions used in merchant ships, and that this point should have been considered by them before undertaking the homeward voyage.

"We have, &c.
(signed) "*Walter Dickson*, M.D.
"*J. O. P. Stuart.*"

"J. J. Mayo, Esq.,
"Registrar General of Seamen."

Mr. *Macintyre* to Board of Trade.

(M. 7434.)

19, Birchin-lane, London, E.C.,
16 October 1867.

Sir,

YOUR favour of the 10th instant, M. 7193, has been forwarded to me here from Liverpool. I have to apologise for not sooner replying to it, but numerous engagements have prevented it.

The report of the Inspectors upon the cases of scurvy which occurred on board the ship "Riversdale" has had my serious attention, and I have to acknowledge the general correctness with which the inquiry has been reported to the Board of Trade.

As it is evident from the report itself, that the "Riversdale," when she left London, was furnished with an abundance of every description of stores, obtained from houses of the highest respectability, to which, I may state, a large extra supply of fresh provisions was added, in consequence of her being a passenger ship, all of which were freely distributed to the crew as well as to the passengers, I trust the owners will be exonerated from all blame in the matter, and that the six cases of scurvy will be attributed to the fact of the men being predisposed to it, all having been transferred from the ship "Clydesdale," only just arrived at Calcutta, after a four months' voyage, and being, during the five or six days they were in harbour almost constantly under the influence of liquor. Under such circumstances it is not to be wondered at that, commencing a new voyage of three or four months more, without the advantage of the fresh diet the other hands

"Riversdale."

hands, who went out and returned in the "Riversdale" had enjoyed, they should be ready recipients of the disease, whilst not one of the ship's original crew suffered.

As regards the lime juice; from all I can learn on board the ship, I am of opinion that it was of good quality. I say this in justice to the manufacturers. No doubt it was discolored (probably from being so long in a wooden cask), otherwise, none of the officers can say it was really bad; but, being discolored, it was thought so; at all events the sailors (never very fond of the article) refused to take it, and the captain, not anticipating such an inquiry, foolishly acquiescing in their opinion, condemned and destroyed it, thinking that the other restoratives he had on board, viz., claret, rum, gin, potatoes, soups, &c., which he freely distributed, would be equally efficacious. I exceedingly regret that it was not preserved. I regret also it was allowed to go on board in a cask. It is not our usual practice, as you may perceive from the ship's previous supply being in jars and bottles; and in this manner we shall take care it shall always in future be procured. This is all I can say of the lime juice. except that we got it from one of the first houses in London, and, of course, paid the highest price for it.

The Inspectors state that "the only point in which the requirements of the "Act seem not to have been complied with is, that the master, when aware of the "faulty character of the lime juice, did not procure a fresh supply at the Cape of "Good Hope, or St. Helena." I have spoken to Captain Carter about this, and his answer is, that he only broached the cask of lime juice a short time before reaching the Cape; that none then objected to it; and that as the first real case of scurvy was on the 23rd of August, whilst he passed the Cape on the 3rd, and St. Helena on the 13th August, there was no need whatever for his doing so.

I hope this explanation will be sufficient to satisfy the Board, that no charge can be substantiated against the ship or its owners, nor yet against the master, whose general kindness towards his men is well known, but that the true cause will be assigned, viz., that the men commenced their return voyage earlier than was prudent, and thus laid themselves open to attack.

Regretting it on the men's own account, and regretting it for the notoriety the ship has unjustly sustained from the inquiry,

I remain, &c.
(signed) *L. H. Macintyre.*

Thomas Gray, Esq., Assistant Secretary,
Marine Department, Board of Trade, Whitehall, S.W.

— No. 4. —

(M. 7890.)

"Gossamer."

"GOSSAMER."

The Superintendent at Dock-street, on October 23rd, reported eight cases of scurvy on board the "Gossamer." The Seamen's Hospital Society also reported having received two cases on board the "Dreadnought" from the same vessel.

Drs. Dickson and Leach were appointed inspectors.

The following is their report, a copy of which was sent to the "Shipping Gazette," and to Messrs. Potter Brothers, the owners:—

(M 7646)

"14, Trinity-square, Tower-hill,
31 October 1867.

"Sir,

"We have the honour to report, for the information of the Board of Trade, that, in compliance with your letter of the 24th instant, we have made inquiry into the circumstances of the breaking out of scurvy on board the 'Gossamer.'

"We find that the 'Gossamer' (Official No. 50,265) is constructed partly of iron, is of 734 tons, belongs to the Port of Liverpool, and is the property of Messrs. Potter Brothers.

"She sailed from London on the 5th of January on a voyage to China, touched at Anger Point (Java) for fresh provisions on the 17th of April, arrived at

“Gossamer.”

at Shanghai on the 28th of May, remained in port till the 18th of June, when she commenced her return voyage; sighted the island of St. Helena on September 15th, and arrived in the Thames on the 21st of October.

“Her crew consisted of 25 hands, all told, and were quite healthy on the outward voyage, with the exception of one man, who was disabled with dysentery, and was therefore discharged to the shore at Shanghai, another man obtained there being shipped in his stead. While in harbour there does not seem to have been any serious sickness, although two men contracted venereal, and one of them, while under treatment for that disease, became affected with scurvy. He is entered on the official log-book for the latter disease on September 8th. The persons named in the margin were all affected with scorbutic symptoms either about that time or subsequently, and two of them, J. Tulloch and T. Erichsen, are now under treatment on board the ‘Dreadnought’ hospital ship.

J. Tullock.
J. Erichsen.
— Parker.
— Matthews.
— Watkins.
— Gough.

“As the vessel was being moved about from wet to dry, and from dry to wet dock, we were unable to visit her till the 29th instant, but as we found no responsible officer on board, we had to visit her again to-day. The master, Mr. John Thomson, was absent, having, as we were informed, gone some days ago to the north of England. We saw the chief mate, Mr. Henry Walton, with whom we inspected the ship, now lying in the West India Docks, and such of the provisions as remained on board.

“These were described as being the articles ordinarily in use in merchant vessels, and to have been sufficient in quantity and of good quality during the entire voyage. They were procured from various houses at Liverpool and London. We tasted the biscuit, which was good. Soup and bouilli (preserved) were given every Sunday. Preserved potatoes, of which two or three hundredweight had been procured, were also occasionally served out, as were dried beans, or calavances. Fresh potatoes were issued twice a week on the outward voyage while they lasted, and a supply of green vegetables was procured at Anger Point. In harbour, at Shanghai, fresh meat and green vegetables were given daily. A stock of fresh potatoes was taken from thence and served out daily in the first week of the return voyage. Afterwards soup and bouilli and preserved potatoes were occasionally given. Vinegar, pickles, and molasses were also stated to have been regularly supplied to the crew. Rum did not form a regular article of diet, but was served out weekly, or in bad weather, &c., at the discretion of the captain. Water was obtained at Shanghai, it was said from a lake in the neighbourhood, and no complaint appears to have been made concerning it.

“The lime juice had been procured from Messrs. Mardon and Norbury, of Liverpool, 25 gallons in five five-gallon jars. It was served out weekly, in sufficient quantity, for the men to mix and drink at discretion, but the officer examined could not speak as to whether they all drank it. About two gallons remained, which we have examined. It has the appearance and taste of genuine lime juice somewhat impaired by time and exposure, and has no admixture of spirit. No adulteration can be detected; its specific gravity is 1023, and it contains 23 grs. citric acid* (pure) per fluid oz. Wine and beer are also stated to have been given to the sick, and such articles as preserved soups, arrow root, &c., of which there seems to have been no lack.

“The accommodation for the the crew consisted of two spacious well-arranged deck-houses, with comfortable bunks, well-lighted and ventilated, and more than sufficient for the number on board.

“We afterwards proceeded on board the ‘Dreadnought’ to examine the two patients there. J. Tulloch stated that he had contracted venereal at Shanghai, for which he was treated with mercury, and soon after was seized with symptoms of scurvy. His lime juice had been stopped, as it was supposed to be likely to interfere with the action of the remedy, and it does not appear he took any on the voyage home. He had only been three weeks in England before joining the ‘Gossamer,’ having just before returned from New Zealand. J Erichsen had been some weeks on board the ‘Dreadnought’ on a previous occasion, suffering from venereal, and almost immediately after had joined the ‘Gossamer’ at the beginning of her voyage. He was placed on the sick list with scurvy on the 3rd of September, was treated with additional quantities of lime juice

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* Equal to 30 grs. of the crystallised citric acid of commerce.

"Gossamer."

juice, preserved potatoes, wine, beer, and other comforts, as had been stated by the mate, but without improving. Both men stated that the provisions were of average quality, and in the main they corroborated the evidence of the mate as to the issue of preserved and, occasionally, of fresh vegetables. The lime juice is said to have been issued and taken irregularly, and without an accompanying ration of sugar.

"In this instance the outbreak of scurvy is less easily accounted for than in most ships that have come under our notice. The diet was more than usually varied, and the lime juice was of fair quality. It was certainly taken irregularly, and not at all by one of the greatest sufferers, on account of the captain erroneously supposing that it would be injurious to him.

"In this man's case, as well as in the others, it would seem that previous illness had predisposed them to the scorbutic attack, and the more as both appear to have been almost continuously at sea for a very long time, only a few weeks in either instance elapsing between two long double oceanic voyages.

"The only point in which the provisions of the Merchant Shipping Act do not seem to have been complied with is the irregularity in issuing the lime juice; and the omission on the part of the master to call at St. Helena for fresh provisions, when scurvy had declared itself among his crew, seems also deserving of censure.

"We have, &c.
(signed) "*Walter Dickson*, M.D.
"*Harry Leach*."

— No. 5. —

(M. 9812.)

"Roslin Castle."

"ROSLIN CASTLE."

The Seamen's Hospital Society on 16th December reported having admitted a case of scurvy on board the "Dreadnought" from the "Roslin Castle," and that eight or nine of the crew were also affected.

Dr. Dickson was appointed inspector; the following is his report, a copy of which was sent to the owner of the vessel:—

(M. 9343.)

"14, Trinity-square, Tower-hill, E. C.,
"27 December 1867.

"Sir,

"I have the honour to report, for the information of the Board of Trade, that in compliance with your instructions in letter of 20th instant, I have visited the "Roslin Castle," and made inquiry into the circumstances of the outbreak of scurvy in her crew on the homeward voyage.

"The 'Roslin Castle' is a ship of 1,170 tons register, the property of Donald Carry & Co., of Liverpool, and commanded by Mr. Thomas Frater; she left London with a crew of 29, all told, on the 2nd of March 1867, and arrived at Calcutta on the 20th of June; she remained there till the 24th of July, sighted the Cape of Good Hope on the 29th of September, and the island of St. Helena on the 11th of October, and arrived in the Thames on the 14th instant.

"The health of the crew on the passage out is reported to have been good; while at Calcutta one of them died after a few hours' illness of cholera, and the third mate died of acute dysentery two days after leaving the port. During the voyage home the crew are said to have been quite healthy until the last month of the voyage, in which five cases of scurvy of greater or less severity were placed on the list.

"John Fell, an elderly man, who had partially lost his eye-sight while in the Peninsular and Oriental Company's service in India, and was sent home as a distressed British subject, did work till the last week, when he was entered on the sick list for scurvy, and is now a patient in the 'Dreadnought' Hospital.

"— Roberts, who had long had ulcer of the leg, and is said to have been regardless of personal cleanliness, showed scorbutic symptoms a fortnight before arrival.

"— Yates, an elderly man, was relieved from duty with scorbutic symptoms about three weeks before arrival, but recovered.

"— Hooper

"Roslin Castle."

"—Hooper, also elderly, about 50, had marks of scurvy about 10 days before arrival, in the form of black spots on the legs.

"— White was affected with tender groins and general debility three weeks before arrival.

"— Germaine had general pains, but whether scorbutic or not seems to be uncertain.

"(As the official log-book had not been received into office, I have given the names and dates approximately from the evidence of the chief officer, and I would suggest comparison and correction when the official documents come to hand.)

"All these men, with the exception of Fell, had been in the vessel all the time of her double voyage; besides the deaths noted, two men were discharged at Calcutta, two others being shipped in their room.

"The provisions were those usually agreed on, were sufficient in quantity and of good quality; in addition to the ordinary diet a mess of preserved potatoes and soup and bouilli was served out once a week; a pound of butter was also given weekly to each man; fresh potatoes were also issued after leaving Calcutta once a week on five occasions, and fresh pork twice on the passage home.

"While in harbour fresh meat (one and a-half pounds per man) and vegetables were daily supplied to all hands.

"The lime juice is said to have been served out daily, as the regulations require; it was stowed in five-gallon jars, and the remains, which I examined, were of good quality, possessing the appearance, taste, and odour, of sound juice; its specific gravity was 1,035, its acidity equal to 24 grains pure citric acid, or 30 grains crystallized commercial acid in the fluid ounce, and it was free from adulteration with other acids; it had been obtained with the other provisions from A. Lusk & Co. No precise evidence was given as to whether the crew took it regularly, or as to its being taken before their illness by those affected with scurvy, all of whom had left the ship; while on the sick list their allowance had been increased, and preserved vegetables, as potatoes and green peas, and other indulgences, had been afforded them.

"The ship appears to have been conducted on strictly temperate principles, no spirits being allowed at any time.

"The accommodation for the crew was spacious and good; 18 were berthed in a light, airy, and dry top-gallant forecastle, and the rest in a comfortable deck-house, fitted, like the forecastle, with berths.

"The cause of the outbreak of scurvy in this vessel is obscure, provided the lime juice exhibited was, as is alleged, served out in sufficient quantity and was duly taken. In the two visits I made I obtained the evidence of the chief officer, Mr. F. J. Evans, and the steward, but the testimony of the men affected is desirable. It may be noted that three of them were old sailors, and, as is well known, there often exists an unreasonable prejudice against taking lime juice, and more stubbornly among the older men. In other respects the crew appears to have been well cared for, and there was considerable and judicious variety in their diet; but the stay of the vessel in port was probably too short, and the change of food, only three weeks on fresh provisions, was insufficient to insure all the crew from scurvy. Accordingly, in the latter part of the voyage, when, with the brief exception named, they had been nine months on sea diet, the disease began to manifest itself; the homeward passage was unusually protracted, and if, as might have been expected, the ship had arrived three weeks earlier, no case of scurvy would have occurred in her. So far as I can ascertain, the requirements of the Act have in all respects been complied with.

"I have, &c.
(signed) "*Walter Dickson*, M.D."

"Thomas Gray, Esq.,
"Assistant Secretary, Marine Department."

— No. 6. —

(M. 1868.)

“ Henry Adderley.”

“ HENRY ADDERLEY.”

Seven of the crew of the “ Henry Adderley ” having been reported to be suffering from scurvy, Dr. Leach was appointed inspector, to inquire into the circumstances attending the outbreak.

The following is his report, a copy of which was sent to Mr. Harris, the owner of the vessel, to which is appended his reply to the letter from the Board of Trade ; a copy was also sent to the “ Shipping Gazette.”

“ Office of the Medical Inspector
“ Appointed by the Board of Trade,
“ 41, Great Tower-street Buildings, E. C.,
“ 5 February 1868.

“ Sir,

“ I have the honour to forward, for the information of their Lordships, the result of an inquiry ordered to be made (in a communication bearing date 1st February) into the circumstances of the breaking out of scurvy on board the ‘ Henry Adderley.’ The ‘ Henry Adderley ’ is a barque, of 687 tons register, belonging to the port of London, and owned by Mr. Samuel Harris, of Mansell-street, Goodman’s-fields. She sailed from England on the 17th of January 1867, for Kurrachee, and returned from that port to London after a passage of 130 days, the official log book being delivered up on the 29th ult.

“ I inspected the vessel, which is lying in the London Docks, on Saturday the 1st ult., and, in the absence of Captain Hartman, was attended by the mate, George Causey.

“ I examined the beef, pork, biscuit, and vinegar, and took away a sample of the lime juice for analysis. All these articles (with the exception of the lime juice, to be presently described) were in very excellent condition, and they were, as I was informed, a fair sample of those consumed during the voyage.

“ The crew were berthed in a deck-house, which was divided into three distinct compartments, one being occupied by the men, another by two of the sick, and a third by the carpenter and boatswain. These quarters were good, and very fairly clean. Two water-closets existed near the bows, one of which was used by the officers, and the other by the crew. No sample of the water used for drinking purposes could be obtained, but I was informed by the mate (which information was subsequently and independently corroborated by the master) that it had been brought to Kurrachee from a distance by railway (as is the custom), it being well known that Kurrachee water is bad, and provocative of dysentery. The evidence of the mate as to provisions, treatment, and cleanliness of the ship, during the voyage, was satisfactory, and I have seldom seen any vessel cleaner on arrival in port. On Monday, Captain Hartman called at this office by my request, and gave evidence as to the provisions, accommodation, and health of the men. He informed me that the stores and provisions, including 12 gallons of lime juice, were supplied by Messrs. Warner & Co., of the Minories. It appears that four gallons of lime juice, which had remained from a previous voyage, were first used, that the 12 gallons shipped by Messrs. Warner were next served out, and that, towards the close of the voyage, a small quantity of the juice obtained at Kurrachee was given to the men, of which that taken from the ship on Saturday last was a sample.

“ I may here record that this juice proved on examination to be altogether deficient in all the essential qualities of good lime or lemon juice, and I can have no hesitation in saying that it could not, at any time during the passage, have possessed antiscorbutic properties. I learnt from the master that the lime juice was served out weekly, and that, as far as he knew, it was generally taken by the crew. The evidence of the mate as to provisions, &c., was corroborated by the master, who appeared to have acted with discretion in all general hygienic arrangements, and expressed regret that he had not ordered the lime juice to be served out daily instead of weekly. On the 4th ultimo, I called at the house of Dr. Budjett, of 7, King’s-place, Commercial-road, East, and received from that gentleman much courteous attention. Dr. Budjett was summoned to attend several of the crew of this ship immediately after her arrival, and proceeded to a lodging in the neighbourhood of Well-street, in which he found

"Henry Adderley."

John Burns, A.B., *John Fulcher*, A.B., *William Herritson*, A.B., *John Williams*, A.B., and *George Rutherford*, A.B., all very seriously affected with scurvy.

"*John Williams*, appears from the evidence of the captain, mate, and others of the crew, as well as from particulars recorded in the official log-book, to have been continually off duty during the passage out, to have been affected with scurvy even before the ship reached the Cape of Good Hope on the outward passage, to have been frequently ill while the vessel lay at Kurrachee, and to have ceased to do any duty after the 4th of December. This man died shortly after his removal from the ship, and I am informed by Dr. Budjett that the post-mortem examination revealed some organic disease of the lungs, with the usual symptoms of scurvy in a marked degree. This patient was attended by a medical man at Kurrachee, who, according to the official log-book, is said to have stated that 'the patient was suffering from the effects of old venereal disease which had been badly treated.'

"*George Rutherford* was, according to evidence adduced, and from the official log-book, occasionally off duty during the voyage, and gave up work suddenly about three weeks before the arrival of the ship, having then for the first time confessed to an illness of long standing, which, from the explanation given, appears to have been dysentery, and probably of a scorbutic nature. He is also dead, but no post-mortem examination was performed in this case, because the medical evidence was deemed conclusive as to scurvy and dysentery being the causes of death. It should be remarked that this patient shipped in London immediately after his discharge from the 'Dreadnought' hospital ship (with 'Relieved' marked on his card), where he had been treated for rheumatic pains.

"I examined *John Burns*, A.B., and *John Fulcher*, A.B., now convalescent, but still very weak, both of whom corroborated all previous evidence as to the quality of provisions, and amount of accommodation; and by both of whom the lime juice appears to have been taken about three or four times a week.

"*Lawrance Wray*, A.B., also corroborated the evidence above recorded, and added, that he never sailed in any British vessel better furnished as to provisions. The captain, who was accompanied by his wife on the voyage, appears to have acted kindly to the sick, and gave them arrow-root, sago, and corn flour when they were unable to eat the usual rations. He did not go into St. Helena, because a rumour had arisen on board that some of his crew intended to leave the ship, but he anchored off Ascension, took Williams on shore for advice, and procured an additional stock of biscuit. The supply of sugar was exhausted on the 15th January, and during the ensuing week, 1½ pint of molasses was served out to each man, one pint being subsequently given to each of the crew for the last four days of the voyage.

"Two men died during the passage home, one of whom was shipped at Kurrachee; the name of the other does not appear on the articles."

The causes of death are in both instances very obscurely stated. "It should also be stated that the crew were well supplied with fresh meat and vegetables whilst in harbour at Kurrachee. No grog was given.

"In summary of the foregoing, I take leave to draw the attention of their Lordships to the fact, that the evidence is unfortunately incomplete, because none of the lime juice supplied to the ship when she sailed from London is obtainable for the purpose of examination. It was kept as usual in bulk, and the London supply was exhausted about three weeks before the arrival of the ship.

"There can be no reasonable doubt that the deaths of Williams and Rutherford were accelerated by scurvy; and, having regard to the following facts:—

1. That these, as also the other three men affected, went out in the ship,
2. That the provisions and accommodation were good and sufficient;

there is strong presumptive evidence that the quality of the lime juice, or (if good) its irregular imbibition, tended to cause this outbreak of scurvy.

"The lime juice was served out weekly, instead of daily, and therefore in this respect there was not a strict compliance with the provisions of the Act.

"The case of *George Rutherford* points to the necessity and the usefulness of clause No. 10 of the Merchant Shipping Act, 1867, and there can be little doubt

"Henry Adderley."

doubt that had the Act then been in force and active measures taken under the clause above referred to, the life of this sailor might have been saved, and much inconvenience from loss of service, &c., would have been spared to owner, captain, and crew.

"I have, &c.
(signed) "*Harry Leach.*"

"The Assistant Secretary,
"Marine Department, Board of Trade."

Mr. *Harris* to Board of Trade.

(M. 1591—2744.)

Sir, London, 3 March 1868.

I beg to acknowledge receipt of your letter of 27th ultimo, enclosing a copy of report on the outbreak of scurvy on board the "Henry Adderley." I deeply regret this most unfortunate occurrence. I may observe on behalf of myself and the other part owner, that we did not either of us attend personally to the management of the vessel, being too much engaged in other affairs to do so. We entered into an arrangement with Captain Hartman to man and provision the ship for 130 *l.* (say one hundred and thirty pounds) per month, which sum, upon inquiry, we were led to believe was fully sufficient for the purpose. The above sum was proposed by Captain Hartman, and no abatement was asked. Our agreement specially required that the ship should be properly manned and provisioned.

Previously to our purchasing the "Henry Adderley," in November 1866, Captain Hartman had commanded her for a long time, and we believed him to be well qualified to do so, and that we could safely leave the management of the ship in his hands.

I am, &c.
(signed) *Sam. Harris.*

Thomas Gray, Esq.,
Board of Trade, Whitehall.

— No. 7. —

(M. 3327–5329.—1869.)

"Glendower," "Merrie Monarch," and "Giants' Causeway."

"GLENDOWER," "MERRIE MONARCH," and "GIANTS' CAUSEWAY."

Her Majesty's Consul at Callao, on the 10th March and 20th April, forwarded reports relative to cases of scurvy on board these vessels.

The following are the reports:—

(M. 3327.)

No. 5.

Report of Drs. Dann and Roe, Callao, 28 February 1869.

"British Consulate, Callao,
"10 March 1869.

"Sir,

"I have the honour to enclose a copy of a report which has emanated from a request which I made to Dr. Dann, of Her Majesty's ship 'Reindeer,' and Dr. Roe of the British Hospital, to hold a survey on the British ship 'Glendower,' Official, No. 24,093, which lately arrived in this port from Aden with several cases of scurvy on board.

"The circumstance of the Acts of Parliament, 1854 and 1867, having been complied with in the case of the 'Glendower,' and of two other vessels, the 'Morning Light,' and the 'Mistress of the Seas,' having arrived from Aden without any cases of scurvy, induced Drs. Dann and Roe to investigate the causes which led to such different results, and the conclusions which they have arrived at, based on long practical experience, and confirmed by the present inquiry, render their report, in my opinion, very valuable, and one to which I would respectfully call the attention of the Lords Commissioners of the Board of Trade.

"Glendower," "Merrie Monarch," and "Giants' Causeway."

I have, &c.
(signed) "*C. A. Henderson.*"

"The Assistant Secretary,
"Marine Department, Board of Trade."

REPORT of Drs. *Dann* and *Roe*.

"Sir, "Callao, 28 February 1869.

"IN compliance with your request, we, the undersigned, went on board the British ship 'Glendower,' of Liverpool, Official Number 24,099, to examine the provisions, medicines, and stores, with a view to discover the cause of the scurvy which affected the crew of that vessel.

"The 'Glendower' left Liverpool on the 27th of May 1868, laden with coals, for the port of Aden, in the Red Sea. She had a crew of 25 persons, including officers. A small stock of potatoes was taken from Liverpool, and portions of it were issued to the crew twice a week for four or five weeks. Lime juice was issued to the crew, and was regularly taken by them from the tenth day after leaving England. The diet, during the voyage to Aden, was on the scale provided by Act of Parliament, but once a week preserved 'soup and bouilli' was issued in lieu of salt provisions. The ship arrived in Aden on the 15th September, some of the crew having been sick during the voyage, and two, who had had syphilis, were sent to hospital in Aden with scurvy, one on the 19th of September, and the other on the 22nd of October, and they are at present sufferers from the disease in an aggravated form. Besides these two, others of the crew were affected with scurvy in Aden, and in consequence the vessel was surveyed by the medical superintendent at Aden, who pronounced the provisions to be 'good and ample,' and the 'accommodation to be good,' and who further reported that 'the cause of the men having the scurvy was the usual want of fresh vegetables, or substitutes.'

"The diet given to the men in Aden consisted of 2lbs. of fresh beef per man per day, and as much hard bread as they could eat. Occasionally a pumpkin was procured for the soup, and a little flour was given for 'doughboys.' The peas, vinegar, flour, and lime juice, were stopped. On the men representing that they could not eat the hard dry fresh beef, fish was procured for breakfast, and they got an occasional meal of preserved potatoes for dinner, if the fresh beef did not come off. After the medical survey at Aden on the 23rd of October, lime juice was issued to the crew daily, by order of the medical superintendent, and it was continued as a daily ration up to the date of the vessel's arrival in this port.

"The vessel left Aden on the 4th of November with the same number of persons on board as when she left England, the chief officer and the steward having been discharged, and two men who ran from an American ship having been taken on board to work their passages to this port. These two men did not suffer from scurvy on the voyage. Almost immediately after the ship left Aden, the men began to break down, and she arrived here with five men very ill, two considerably affected by the disease, and several with slight sponginess of the gums and effusions about the knees and ankles. The only treatment which appears to have been adopted was the putting the sick on a diet of arrowroot, sago, and rice, and allowing them to rest from duty. Some of the sick refused at times to take their lime juice, alleging that it had become unpalatable,

"On examining the provisions, we found that they were, without exception, good of their kind, and no complaint was made to us by any of the crew with reference to the provisions. The water was pure and good. The medicines were of fair quality, and appeared to have been supplied according to scale. The lime juice was duly certified and labelled according to Act of Parliament, and the labels were intact on the bottles. The forecastle was certified to accommodate 23 persons, but not more than 15 occupied it at any time.

"As many vessels have recently arrived at this port from Aden, the crews of some of which have been afflicted with scurvy, whilst those of others have been entirely

"Glendower," "Merrie Monarch," and "Giants' Causeway."

entirely exempt from that disease, it may be useful to compare the conditions under which the crews of different vessels have performed the same voyage. We have now before us the notes of an inquiry instituted by Dr. W. H. Cruice, of Her Majesty's ship 'Malacca,' and Dr. G. A. Roe, of the British Hospital at Callao, into the circumstances of a voyage performed by the ship 'Morning Light,' of Liverpool, master W. Buchanan, with a crew of 42 persons. The 'Morning Light,' laden with coals, left Liverpool for Aden on the 14th December 1867, and reached that port on the 16th April 1868, leaving it on the 21st of April for Annesley Bay, where she arrived on the 26th of the same month. In Annesley Bay the crew discharged 2,800 tons of coal, and took on board between 700 and 800 tons of ballast. She left Annesley Bay on the 19th of June, and arrived in Aden on the 25th, finally leaving that port for Callao on the 10th July, and arrived here on the 21st of October. She occupied 313 days in performing the round voyage, as against 271 days in which it was accomplished by the 'Glendower.' On the voyage from England, on board both ships, preserved meat was issued once a week in lieu of salt provisions, but on board the 'Morning Light' preserved vegetables were issued with the preserved meat. The lime juice issued by the 'Morning Light,' on the voyage out, was not certified, as the vessel left England in 1867. No fresh vegetables could be procured at Annesley Bay; a kind of grass was used in the soup for a few days, but the men refused it. Occasionally half a pumpkin was obtained for the soup, and sometimes a few stale onions. Fresh meat was procurable in Annesley of the same character as that to be obtained in Aden, but it was disliked by the men. Lime juice, mixed with rum, was issued to the crew every day during the ship's stay in Annesley Bay, as well as when she was at sea. Whilst the men were working the cargo out, they were allowed oatmeal to mix with their water for drinking, tea and coffee were served three or four times a day, and a glass of rum was given to each man every day. Rice, barley, and flour were issued every day for the soup, and the sea allowance of flour and peas, on alternate days, was continued. Shortly before the ship left Aden for Callao, the men began to exhibit signs of scurvy, and they were greatly debilitated, one man especially being very ill, and it was now that Mr. Buchanan showed his wisdom and energy. He procured, at a heavy price, a stock of potatoes, onions, and pumpkins, and he also procured a case of lime juice, certified and labelled under the Merchant Shipping Act, 1867. During the voyage from Aden to this port he induced each man to eat, raw, one potatoe and two onions every day. He issued soup and bouilli two or three times a week, together with an ample allowance of preserved vegetables, or rice, barley, and flour. Soup was made every day, either by boiling peas with the salt pork, or barley and rice with the salt beef, when salt provisions were issued; and each man had a glass of rum per day for nearly half the passage. The men were allowed to have as much fresh water as they pleased, and they were encouraged to wash in it and keep themselves clean. Immediately on the ship's arrival at this port, the crew were carefully examined, one by one, and they were found to be in excellent health and spirits, one man only showing any symptoms of scurvy, and in him there was but slight sponginess of the gums, whilst in other respects he was strong and healthy. Whilst we were engaged in the survey on the 'Glendower,' a vessel called the 'Mistress of the Seas,' of Liverpool, arrived here from Aden. We immediately went on board to examine into the condition of the crew, and to discover what means, if any, had been adopted to prevent scurvy. We found the whole crew in good health, and no traces of scurvy could be found in any person.

"The 'Mistress of the Seas' left Cardiff on the 20th of May 1866, with a cargo of coals for Aden; she arrived at Aden on the 13th of September, and left that port for Callao on the 14th November, arriving here on the 24th February 1869. The round voyage occupied 281 days. The 'Mistress of the Seas' left England with a good stock of vegetables, and for the first three weeks the crew had every day as much vegetables as they could use, and subsequently they got a meal of potatoes once a week for some weeks.

"Whilst the ship lay in Aden, the only vegetables that could be procured were pumpkins and onions. Before leaving Aden, the master took on board 21 sheep, four pigs, and a quantity of pumpkins and onions; besides which, he

induced

"Glendower," "Merrie Monarch," and "Giants' Causeway."

induced each man to buy a private stock of at least 28 lbs. of onions, and many of them bought even more.

"After leaving Aden, lime juice was issued every day, and every morning each man eat raw two or three potatoes, which had been brought from England preserved in molasses. These potatoes appeared to us to be admirable antiscorbutics. They had been carefully and thoroughly washed, and packed lightly in a cask, which was then filled with molasses. The molasses, and the juice of the potatoes, underwent a fermentation, and a strong spirit was formed, the potatoes losing considerably in bulk. They were used by cutting them into thin slices, and dipping each slice into the preserving fluid as it was eaten. The potatoes preserved in this manner were liked by the crew, and they had an agreeable odour and taste, somewhat like raw chestnuts.

"The vessels which have arrived here with their crews affected by scurvy, constituting the great majority of the vessels coming here from Aden, have invariably been those ships, the crews of which have had but little vegetable food throughout the voyage.

"We consider that the causes of scurvy on board the 'Glendower' were:—

> "1st. That the men were supplied with insufficient vegetable food.
>
> "2nd. That the lime juice supplied to ships under the Merchant Shipping Act of 1867, is not of itself sufficient to prevent scurvy.

"This latter proposition is established by the fact that a number of vessels sailing under the new Act have arrived here with their crews affected by scurvy.

"We beg to append a few remarks on the nature of this formidable disease which have been illustrated by circumstances of the 'Glendower's' voyage.

"A very general impression prevails among shipmasters that laziness is one of the prime causes of scurvy. This idea is a very dangerous and erroneous one. The laziness is the result of the scurvy, and is simply the want of power induced by the lack of nourishment. Men of pluck and spirit, who fight against the disease and who do their duty and exert themselves, are almost invariably the first to fall victims to their zeal; whilst sickly creatures, who may have been bedridden for weeks, live and make rapid recoveries. Scurvy, in fact, is simply starvation, and the more exertion which is demanded of a man when he cannot get nourishment for his exhausted tissues, the sooner will he die. The 'Glendower's' men were tenderly dealt with; they worked when they could, and they rested when they pleased, and the officers of the ship put no undue stress on them, and spared them as much as possible. By getting a few days' rest now and then, they could recruit and recover a little on their diet, which although not sufficiently nourishing to supply the wear and tear of work, was yet sufficiently so to prevent the further progress of the disease when they lay idle. The ship's cook committed an offence on the 13th of November, nine days after the ship left Aden; he was immediately put in irons and imprisoned, and he was fed on a scant allowance of bread and water until the ship arrived in this port. We took pains to ascertain that he got no other food whatever besides his bare allowance. We examined this man very carefully on his arrival here, and we found him in fair health, and without a trace of scurvy. He was not called upon to make any exertion, and latterly he refused to take any exercise during the two hours which were allotted to him for that purpose.

"We have, &c.
(signed) "*Edward Dann*, M.D.,
"Acting Surgeon, Her Majesty's ship 'Reindeer.'
"*Thos. A. Roe*, M.D.,
"Surgeon and Agent, British Hospital, Callao."

"C. A. Henderson, Esq.,
"Her Britannic Majesty's Consul at Callao."

"Glendower," "Merrie Monarch," and "Giants' Causeway."

(M. 5329.)

C. A. *Henderson*, Esq., to the Board of Trade.

No. 8. Sir, British Consulate, Callao, 20 April 1869.

With reference to my Despatch, No. 5, of the 10th March, enclosing a report on scurvey on board the British ship "Glendower," I have now the honour to submit the particulars of a further case, which appears to corroborate the conclusions arrived at in that Report.

The British ship "Merrie Monarch," official, No. 41,881, arrived here on the 14th instant from Aden, having made an average passage, but having the majority of her crew, consisting of 22 men, affected with scurvy, 10 of the number being so severely attacked that it became necessary to send them at once to the hospital.

From an examination of these 10 men, as well as of five of those remaining in the ship, I ascertained that the Acts of Parliament had been fully complied with in this case, the men declaring that they were very well treated during the voyage, that they had rather more than their allowance of water (three quarts each per day), and over their full allowance of lime juice, and that they were given preserved soup and vegetables twice a week on the passage, and fresh meat daily at Aden, with a limited quantity of vegetables.

The only objections raised by some of the men were as to the small allowance of fresh water for washing, the supply on board being limited, and of vegetable food, which they admitted was very scarce at Aden.

These objections do not at present constitute a legal ground for complaint; but it may reasonably be inferred, from the examples cited in the above-mentioned report, that a more liberal supply of water and vegetable food would have materially conduced to avert the breaking out of scurvy on board the "Merrie Monarch."

I have, &c.
(signed) *C. A. Henderson.*

P.S.—April 29. Since the above was written, the British ship, "Giants' Causeway," Official, No. 35,563, arrived here on the 26th instant from Aden, in 145 days, the longest passage that has been made for several years. From an inquiry which Dr. Roe, of the British hospital, instituted on board at my request, it appears that several of the crew, consisting altogether of 24, were ill with scurvy when the "Giants' Causeway" left Aden, but that only three persons, the master being one, were slightly affected by it on arrival here.

The ship left Aden with a small stock of fresh potatoes and onions, and 15 sheep. The potatoes and onions were distributed to the crew and were eaten raw, and lasted about one month, by which time all the sick were cured. Preserved meat was issued thrice a week, preserved potatoes twice a week, and rice every Saturday. A gallon of water was allowed to each man per day until the water ran short, Lime juice was issued at the rate of an ounce twice per day, mixed with rum, sugar, and water. The allowance of peas and flour was increased. The live stock was shared by all hands. The men were not harrassed, and any who did not feel well were allowed to rest for a few days, and Dr. Roe considers that great credit is due to the officers of the ship for their attention to the health of the crew.

C. A. H.

The Assistant Secretary,
Marine Department, Board of Trade.

— No. 8. —

(M. 9216—1869.)

"ROYAL VISITOR."

"Royal Visitor."

The Superintendent at Falmouth, on the 28th September, reported cases of scurvy on board the "Royal Visitor." Dr. Leach was appointed inspector.

The following is his report, a copy of which was sent to Messrs. Hughes & Co., the owners of the vessel. Their observations are appended, as also the explanation of the master of the "Royal Visitor."

(M. 8322.)

"Hospital Ship 'Dreadnought,' S.E.
"Sir, "23 October 1869.

"In accordance with instructions received, and bearing date 29th September, I perused the enclosed minutes, and proceeded to institute an inquiry into an outbreak of scurvy that occurred on board the 'Royal Visitor,' which ship arrived in the Millwall Dock on the 2nd ult.

Returned in original.

"The 'Royal Visitor' is a ship of 1,220 tons register, is owned by Messrs. R. & R. Davies, of Menai Bridge, Anglesea, and sailed from Cardiff on the 31st of October 1868, bound to Point de Galle, with a crew of 25 hands, all told. She reached Point de Galle on the 4th of February ultimo, remained there 26 days, and then proceeded to Rangoon, arriving at that port after a passage of 26 days. The ship was there discharged and loaded with rice in 10 days, started for the homeward passage, and reached Falmouth on the 26th ultimo, not having called at any intermediate port.

"Of the crew shipped at Cardiff, all with one exception returned, one being taken on board at Galle or at Rangoon.

"I visited the vessel in dock on the 4th and 8th ultimo, found her starboard side in a very dilapidated state from the effects of a hurricane, inspected the quarters of the crew, and samples of the beef, pork, biscuit, and water. No vinegar remained. I also obtained evidence from the captain, chief, and second officers, and one of the crew.

"*Accommodation.*—The men were berthed in a top-gallant forecastle, which is divided fore and aft into two compartments, each calculated to accommodate nine men. These quarters are tolerably spacious, but insufficiently ventilated; and I may here remark that the evidence taken at Falmouth as to a leak alleged to exist in the starboard side was not confirmed by the captain and mates, but was not positively denied by them.

"The rest of the crew were berthed in the cabin, with the exception of the cook, who slept in the galley.

"*Provisions.*—All the provisions examined were good, and the water was fairly good.

"*Lime Juice.*—The Surveyor of Customs at the dock gave me an opportunity of inspecting the lime juice, and kindly caused the capacity of the bottles to be measured for my information.

"From this it appears that 16 dozen quarts of juice were put on board at Cardiff, and that five or six dozen quarts still remained in the ship from the previous voyage, making a total of about 11,088 ounces of juice. The Surveyor of Customs informs me that 6,930 ounces were returned among the bonded stores, so that about 4,150 ounces of juice were served out during the entire voyage, which (after making all proper deductions according to the provisions of the Act of 1867) is less by about 500 ounces than should have been given, even assuming that neither the captain, mate, second officers, or steward took any at all.

"*Summary of Evidence.*—The evidence of the captain was to the effect that the health of the crew on the entire passage out, at Galle and at Rangoon, was good; that in consequence of the hurricane off the Cape, and severe injuries to the ship resulting therefrom, the men were, during the latter part of the passage, frequently up to their waists in water; that scurvy commenced among the crew when the ship was near the Western Islands, and affected chiefly two men

"Royal Visitor."

(Mahoney and Owen) who had been much bruised in the storm above mentioned; that five or six men were more or less ill with scurvy, but that two only (those left at Falmouth) were laid up; that preserved provisions were served out often during the voyage, that the lime juice was given out daily, and, according to his belief, regularly taken by the men; that Mahoney appeared to be in a bad state of health when he came on board at Cardiff; that he (the captain) gave the sick compressed vegetables, preserved meats, pickles, and potatoes, and was greatly impressed with the very good effect produced by the last-named vegetables.

"This evidence, given with great courtesy and considerable perspicuity, was forcibly supplemented by the remark that 'the scale of provisions on board ships should be altered so as to do away with lime juice altogether."

"The first and second mates severally and independently corroborated the testimony in chief of Captain Llewellyn, but the evidence of the seaman is valueless, because he was intoxicated when under examination.

"*Points for Consideration.*—There are six points arising out of this inquiry to which I take leave to direct the attention of their Lordships—

"1. The conflicting evidence relative to a leak in the forecastle.

"2. The insufficient ventilation of the forecastle.

"3. The conflicting evidence as to the number laid up with scurvy.

"4. The fact that on many occasions the men worked continuously in water.

"5. The existing discrepancy (*a.*) in the statement made that the lime juice was given out regularly and daily; (*b.*) the fact that the quantity above stated still remains on board the ship.

"6. The opinion (many times recorded in former official inquiries) of the master as to a radical change in the scale of provisions commonly used in long-voyage ships.

"Having regard, therefore, to the foregoing points, I submit the following conclusions for consideration:—

"*a.* That the provisions were good, and, with one exception, the health of the crew was originally good.

"*b.* That certain deficiencies (stated above) in the arrangements of the forecastle and the unavoidable results of the hurricane were predisposing causes of sickness.

"*c.* That the lime juice was not at all times given out and taken regularly (though I fully believe that Captain Llewellyn desired to fulfil his duty in this respect).

"*d.* That if the lime juice had been given and taken regularly, this outbreak of scurvy might have been prevented.

"*e.* That the attention of the surveyor should be directed to the defective ventilation of, and alleged leak in the forecastle.

"I am, &c.
"*Harry Leach.*

"The Assistant Secretary,
Marine Department, Board of Trade."

Messrs. *Hughes & Co.* to Board of Trade.

(M. 9498.)

Sir,
Menai Bridge, 5 November 1869.

Referring to your communication of the 2nd, respecting outbreak of scurvy on board the "Royal Visitor," we beg to hand you the written explanation of Captain Llewellyn.

We remain, &c.
(signed) *Hughes & Co.*
Per *R. C. Jones.*

The Assistant Secretary,
Marine Department, Board of Trade,
Whitehall Gardens, S.W.

(Enclosure.)

Gentlemen, Cardiff, 4 November 1869.

In reference to the lime juice on board the ship "Royal Visitor" per last voyage from Cardiff to Point de Galle, and from thence to Rangoon and back to Falmouth for orders, I could not say as to the exact quantity of lime juice which was left from the previous voyage; but the lime juice was served out the whole of the voyage after being at sea 10 days, and there never was any complaints made about the lime juice nor the provisions the whole of the voyage. As for myself and officers, we very seldom took any at all. As for lime juice, I do not believe it will keep off scurvy, whatever other gentlemen may think to the contrary. Those men that had the scurvy with me on the last voyage was all more or less injured in the hurricane which we encountered in lat. 34° S., long. 30° E.; and those injuries turned into scurvy before we got home; the ship, after losing all the bulwarks, kept her decks constantly full of water whenever there was any wind. If we had an ordinary passage I do not believe we should have had any signs of scurvy in the ship at all.

I remain, &c.

To the Secretary of Board of Trade. (signed) *J. Llewellyn.*

Messrs. *Hughes & Co.* to Board of Trade.

(M. 10,070.)

Health of Crews.

Sir, Menai Bridge, 24 November 1869.

We beg to acknowledge receipt of your communication of the 23rd current (addressed to Messrs. R. and R. Davies), referring to previous correspondence relative to the outbreak of scurvy on board our ship "Royal Visitor," and enclosing copy of your surveyor's report, dated Swansea, 13th instant, touching the accommodation for crew in this vessel. In reply, beg to say, we are at all times anxious to do everything we can for the health of the crew, and anything we can do to prevent the outbreak of scurvy again shall have our careful attention; but for many years previous to the alteration in the law respecting lime juice, we have not had a single case of scurvy on board any of our vessels. We attribute the outbreak of scurvy in the "Royal Visitor," in part, to the tempestuous weather she encountered whilst off the Cape of Good Hope upon her homeward voyage, sweeping away her bulwarks, &c., and leaving her crew constantly in water, but chiefly owing to the lime juice, as we have every reason to believe it does not answer the purpose for which it is intended, as used under the new Act; and are strengthened in this belief by the fact of our having only a few days back received a report from the master of one of our vessels at St. Helena, on his way home from India, in which he informs us several of his crew were in the same state, viz., suffering from scurvy; it is our intention to investigate this case on the ship's arrival, and to report thereon.

But to return to the "Royal Visitor," we have to complain at receiving such a report as the above, when the vessel is just on the point of leaving port with her outward cargo. She arrived in London on the 2nd of October last; your surveyor went on board and examined her—made no recommendation. She was put in graving dock, and there re-caulked and re-coppered. Your surveyor never went near her; had he done so, he would have found Lloyd's and other surveyors there to join him in any recommendations he might make, and any alterations required could have been easily effected; but after the ship leaves London and arrives at Cardiff, in the absence of our foreman carpenter, another surveyor comes on board, makes recommendations, which we consider as far as we understand them (such as sheathing forecastle deck), quite uncalled for. All the other things named by him had been done by us before, to the best of our ability, to answer the purposes intended by the Act; and even had they been defective (which we think they are not), we should have been very thankful for any suggestions from your surveyor; but, as before named, we do complain, the report of your surveyor (although written on the 13th instant) was not forwarded us earlier; the vessel is now ready for sea, and to detain her will be a serious loss to us. We, however, forward a copy of said report by this post to

Messrs. Charles Hill and Sons, shipbuilders, &c., Cardiff, requesting them to proceed at once on board, and to do all they can to fulfil the requirements.

Yours, &c.
(signed) *Hughes & Co.*
Per *R. C. Jones.*

The Assistant Secretary
Marine Department, Board of Trade,
Whitehall Gardens, S.W.

— No. 9. —

(M. 10,137—1870.)

“Adelaide,” and “Sterling.”

“ADELAIDE” and “STERLING.”

On 20th October Her Majesty’s Consul at Callao forwarded a report relative to scurvy on board these vessels.

The following is the report :—

“Report on Scurvy.

“ Callao, 20 October 1870

“The ‘Adelaide’ of Liverpool, 1,693 tons register, Master Sinclair Arcts, left Liverpool with a cargo of coals on the 29th of January 1870, and arrived at Aden on the 25th of May. She remained at Aden until the 20th June, when she sailed for this port, arriving on the 26th September. On her arrival here most of her crew were affected by scurvy, but only five were so ill as to be unable to prosecute the voyage. During the voyage from Liverpool to Aden the crew were fed according to the scale commonly used by merchant vessels, varied occasionally by a mess of preserved meat on a Sunday, and every Sunday during the voyage they had some potatoes, which had been brought from Liverpool. Lime juice was issued regularly and daily, according to the Act of Parliament.

“ In Aden the lime juice was stopped, and the men were fed on 2 lbs. of fresh meat per man per day, some pumpkin being supplied for the soup, and the allowance of biscuit being unlimited.

“ The allowance of water throughout the voyage was a gallon per man per day, exclusive of what each might use for drinking, which was not limited.

“ A few days after the ship left Aden the use of lime juice was resumed.

“ Preserved meat was issued to the crew every Sunday, pumpkins were supplied for the pea-soup every second day during the voyage to Callao, but, nevertheless, scurvy appeared, and the allowance of lime juice was then doubled for all hands. The disease, however, continued to make progress, and free use had to be made of the large stock of preserved meats, fruits, and vegetables which was on board, with the effect of arresting, and, in some instances, curing the disease.

“ On the 9th of October the barque ‘Sterling’ arrived here from Aden, with her crew in good health and unaffected by scurvy. Here is a comparison of her voyage with those of the ‘Adelaide’ and ‘Salsette.’

—	‘Adelaide.’ — No. of Days.	‘Salsette.’ — No. of Days.	‘Sterling.’ — No. of Days.
‘England to Aden - - -	117	121	184
‘In Aden - - - - -	25	22	34
‘Aden to Callao - - -	98	100	132
‘Totals - - -	240	243	350

“Whilst the ‘Sterling’ was in Aden her crew was provided with 1½ [illegible] fresh meat per man per day, and in addition they were allowed 1½lb. of fresh potatoes and onions per man per day, besides a liberal allowance of pumpkins and other vegetables of comparatively small anti-scorbutic power.

“During the rest of the voyage the crew of the ‘Sterling’ lived much in the same manner as the ‘Adelaide’s men before scurvy appeared amongst them, except that in cold weather the ‘Sterling’s’ men had a meal of oatmeal porridge every morning.

(signed) “*Thos. A. Roe*, M.D.,
“Consular Medical Officer.”

“Her Majesty’s Consul, Callao.”

— No. 10. —

(M. 1637—1870.)

“SIR HENRY LAWRENCE.”

“Sir Henry Lawrence.”

SEVERAL cases of scurvy having been reported on board the “Sir Henry Lawrence,” Dr. Leach was appointed inspector.

The following is his report, extracts from which were sent to the owners of the vessel; their reply is appended, as also a letter from the master of the “Sir Henry Lawrence,” with reference to the outbreak of scurvy.

(M. 1165.)

“Hospital Ship, ‘Dreadnought,’ S.E.,
“14 February 1870.

“Sir,

“I HAVE the honour to report, for the information of the Board of Trade, that, in accordance with instructions received on the 2nd ultimo, I proceeded to institute an inquiry into an outbreak of scurvy that occurred on board the ‘Sir Henry Lawrence’ during her last passage from Calcutta.

“The ‘Sir Henry Lawrence’ is a ship of 1,221 tons register, and is the property of Mr. John Farmouth, of Liverpool. She sailed from England on the 29th of March 1869, with a crew of (according to the official log) 30 hands all told, and arrived at Calcutta on the 7th of July.

“It appears that 14 men were discharged in India, and that the same number were shipped, with the addition of two hands, the latter signing for 1 *s.* each per month.

“The vessel arrived in the Thames after a passage of 120 days, and two men were shortly afterwards admitted into the ‘Dreadnought’ hospital ship, suffering from scurvy in a severe form. One of these men went out in the ship, and the other joined her at Calcutta, but the name of the latter does not appear at all in the official log, and no mention is made therein as to the illness of either of these men, though one appears to have been sick for about 30, and the other for about 45 days, before the arrival of the ship at Gravesend.

“I visited the ‘Sir Henry Lawrence,’ then lying in the Victoria Dock, on the 3rd ultimo, and, with the assistance of the master, chief mate, and steward, examined samples of the beef, pork, vinegar, and biscuit, and also inspected the medicine chest and the quarters of the crew.

“All samples of the provisions examined were of good quality, and in good condition.

“The lime juice taken out, according to the evidence of the master, consisted of 290 quarts of 40 oz. each. The Surveyor of Customs at the dock informed me that 56 quarts were returned into bond at the termination of the voyage, so that about 9,300 oz. were consumed, which, after making all proper deductions, was sufficient, according to the provisions of the Merchant Shipping Act, 1867. All the stores were supplied by Messrs. George Sutherland, of Liverpool.

“The top-gallant forecastle housed 18 of the crew; three apprentices and the cook slept in a deck-house, four men in a house abaft the last named, and the rest aft. The forecastle is insufficiently ventilated, but I am informed that the owner has already given orders with a view to remedy this obvious and very serious defect.

"The evidence of Captain S. H. Butler, the master of the ship, was to the effect that the crew were healthy during the outward passage, that the lime juice was mixed and given out daily, and was drank regularly by the crew; that one of the seamen brought home sick was in hospital at Calcutta with dysentery, and that the other came on board on the eve of departure from that port, probably in a weak state of health; that soup and bouilli were given once a week, out and home, and also a ration of rum, as well as half a pound of butter per man in lieu of a certain proportion of salt meat.

"The master also further deposed that, up to the time of giving evidence on this inquiry, he was entirely ignorant of the existence of scurvy among his crew (though he had seen many cases some years ago), and that his attention was not drawn to the visible signs of the disease by either of the men.

"The evidence of the mate, steward, and carpenter went to prove that no mention of scurvy was made by any of the crew during the homeward passage, and I am also informed by the Superintendent of Mercantile Marine at the Poplar Shipping Office, that no complaints were preferred on this head by the men when paid off.

"I have examined the men on board the 'Dreadnought," both of whom were suffering severely from scurvy at the time of admission. Both these men averred that five or six of the crew were more or less affected, and both appear to have been in a weak state of health at the commencement of the homeward passage. It seems, however, that neither of these men called the attention of the master to the state of his gums, or to other signs plainly indicative of the malady under which both were labouring.

"There is no doubt that, in this case, the provisions of the Merchant Shipping Act have been complied with, but I take leave to call the attention of their Lordships to the following points, as above recorded.

"1. The omission of all mention as to the sickness of these men in the official log.

"2. The total ignorance of the master as to the nature of the malady, though it was specially marked in both cases, and his former experiences of the malady appear to have been great.

"The second fact is the more remarkable as Captain Butler exercised considerable judgment and ability in treating a case of dysentery that occurred during the homeward passage.

"Having regard, therefore, to the fact—

"*a.* That the provisions were good,

"*b.* That the lime juice was served and taken regularly,

"*c.* That preserved provisions and other medical comforts existed on board this ship,

"it is proper to infer that, had these cases of scurvy been detected, they would have been judiciously treated and speedily cured.

"I have, &c.
(signed) "*Harry Leach.*"

"The Assistant Secretary,
"Marine Department, Board of Trade."

Board of Trade to Mr. *Farnworth.*

HEALTH OF CREWS.

Board of Trade, Whitehall,
21 February 1870.

Sir,

I AM directed by the Board of Trade to transmit to you the accompanyin extracts from a report by Mr. Harry Leach, the inspector appointed by them t inquir inquire into the circumstances attending the outbreak of scurvy on board the "Sir Henry Lawrence."

The Board of Trade would be glad to receive any observations which you may wish to offer with regard to the master's alleged ignorance of the existence of scurvy among his crew, and to his omission to make any entry in the official log book respecting the sickness of the men, as required by the provisions of the "Merchant Shipping Act, 1854."

I am, &c.
(signed) *Thomas Gray.*

Mr. John Farnworth,
Owner of the "Sir Henry Lawrence,"
Liverpool.

Messrs. *Farnworth & Jardine* to Board of Trade.

Liverpool and London Chambers,
Liverpool, 1 March 1870.

Sir,

We must apologise for not replying to your letter of 21st February at an earlier date, but Captain Butler was away on leave for some days, and has gone direct to the ship in London.

We write to-night to our London agents, Messrs. Gilmore, Ranken, Strong, & Co., with your letter, requesting them to give all possible explanations.

We are, &c.
(signed) *Farnworth & Jardine.*

N.B.—Your letter was addressed to the late Mr. Farnworth.

F. & J.

Thomas Gray, Esq.,
Board of Trade, London.

Mr. *Butler* to Board of Trade.

(M. 2237.)

63, Fenchurch-street,
2 March 1870.

Sir,

In reply to your favour of the 21st ultimo, respecting the two men pronounced as having scurvy from the ship "Sir Henry Lawrence," from Calcutta, I beg leave to say, in explanation, that I was quite unaware that scurvy was on board, nor did I even hear mentioned that any of the men were supposed to be suffering from it. The man Murdock complained of spraining his leg whilst aloft, for which I treated him. The man Stewart I considered a clear case of venereal, and treated him for such, according to the medical guide.

In continuation I respectfully beg to state that I have seen cases of scurvy before, but none since I have been master; but in the two men mentioned I could not distinguish any symptoms of such disease, the appearances being totally different from any case of scurvy I have seen. I may add that from the superior quality of the provisions and the quantity of fresh meats, vegetables, butter, lime juice, &c. served out to the crew, I cannot imagine how the men should have suffered from the complaint.

I am, &c.
(signed) *S. H. Butler,*
Master.

To Assistant Superintendent
of Marine Department, Board of Trade.

— No. 11. —

(M. 5360.—1870.)

"DEFIANCE."

The Superintendent at Dock-street having reported, on the 2nd May, eight cases of scurvy on board the "Defiance," Dr. Leach was appointed inspector.

The following is his report, a copy of which was sent to Mr. Bates, the owner of the "Defiance." His reply is appended.

(No. 4111—4506.)

"Seamen's Hospital, Greenwich, S.E.,
"13 June 1870.

"Sir,

"In accordance with instructions received from the Board of Trade, and numbered as above, I proceeded to institute an inquiry respecting an outbreak of scurvy that occurred on board the ship 'Defiance.'

"The 'Defiance' is a full-rigged iron ship of 1,001 tons register belonging to the port of Liverpool, and is the property of Mr. Edward Bates, of 9, Rumford-place, in that town. She sailed from Liverpool for Bombay with a crew of 25 hands, all told, and 109 days were occupied in the passage. The health of the crew was good during the passage, and during her stay at Bombay. No change was made in the crew at that port, and the ship proceeded to Cochin. The master died between Bombay and Cochin, and the agents of the vessel at the latter place appointed Captain Thomas Howard to take the ship to London, where she arrived on the 29th ult., with, at least, nine hands affected with scurvy.

"On the 2nd of May I proceeded to the ship, then lying in the London Dock, examined samples of the biscuit, inspected the quarters of the crew, and took away a little of the lime juice for examination. The evidence of the mate, which was corroborated subsequently by the master, went to prove that the provisions fell short during the homeward passage; that they were supplied with stores of various kinds from no less than three vessels between the Cape and the Western Islands, but did not touch either at St. Helena or Ascension. Both acknowledged that, if assistance had not been rendered by these three vessels, the crew would have been nearly starved. I visited the 'Defiance' for the second time in Messrs. Wigram's dock, Blackwall, and found a cask of beef and one of pork on board, both kinds of meat being of good quality, and would have lasted the crew eight or nine days. The 'medicine chest' was furnished by Messrs. Jones and Whitton, Bald-street, Liverpool, and did not contain the only 'Medical Guide' authorised under the Merchant Shipping Act of 1867. The quantity of lime juice was sufficient, and it appears to have been served out according to the provisions of the Act. The master, who was, as above observed, appointed at Cochin, appears to have exercised humanity and judgment in his treatment of the sick.

"In summary of the foregoing, I take leave to submit the following queries for the consideration of their Lordships:—

"1. Why was the vessel so scantily provisioned?

"2. Why did not the master put into St. Helena or Ascension for further supplies?

"3. Why was not the medicine chest properly furnished?

"*a.* It is plain, from the evidence adduced, that the ship was scantily provisioned, and that the crew would have been starved had not food been obtained from three friendly vessels.

"*b.* It is equally plain that the master of the vessel did not possess, or did not choose to act upon, a discretionary power as to calling at intermediate ports for further supplies for the use of the crew.

"*c.* And there can be no doubt that an infringement of the Merchant Shipping Act of 1867 occurred, inasmuch as the authorised book of directions as to medicines and medical stores was not supplied to this ship before her departure from the United Kingdom.

"These conclusions require no comment.

"I have, &c.
"(signed) *Harry Leach.*"

"The Assistant Secretary,
"Marine Department, Board of Trade."

After the scurvy broke out amongst the Africans, they were supplied with soup. I attribute the breaking out of scurvy to the bad bread and beef.

We were supplied with fresh mutton and pork on occasions during the voyage from Aden. The rice offered to the deceased Nicholas Case, and which he refused, was good. Vegetable soup was supplied to the sick men.

About 900 lbs. of bread was put on board the ship at Aden, and mixed with the bad remaining in the locker.

About three weeks before the arrival of the ship at Callao, we were supplied with good bread.

his
Joseph + Griffen.
mark.

Witness, M. Geo. Russell.

William Lawton, Examined.

I am carpenter of the ship "Princess Beatrice." I have never seen scurvy cases before it broke out on board of the ship on her recent voyage. I joined the vessel in England, and have had good health all the time.

We had a good stock of potatoes on board on leaving England, and they were shared with the crew as long as they lasted.

Since leaving Aden the lime juice has been issued daily a greater portion of the time, but I cannot remember the date of commencement. I have seen medicine taken to the men who were sick with the scurvy, and have heard that other diet was being prepared for them, but cannot say of what it consisted.

I have taken medicine to the Africans in the forecastle. I have heard the crew complaining of the bread at Aden. A fresh supply of bread was purchased at Aden, and placed in the lockers after the old bread was taken out.

The bread was good on leaving England, but before reaching Aden weevles were in it. When we left England there was a good supply of vegetables and potatoes, which, with preserved potatoes in tins, lasted until we reached Aden.

Between Aden and Callao pumpkins were used in the soup, with preserved vegetables at intervals.

The bread supplied to the crew after leaving Aden was that purchased there, and the old bread which was taken out of the locker was given to pigs, and some of it remains on board of the ship.

William Lawton.

Thomas Whiston, Examined.

I am cook of the ship "Princess Beatrice." I have never been in a ship with scurvy on board before this voyage. I cooked all the provisions for the cabin, as well as for the crew. On one occasion the crew complained to me about the flour, and I told them to go aft. Sometimes a piece of beef has been found not to be very good, and has been put on one side; the beef used appeared to be the ordinary quality used on board ships. On leaving England there were potatoes, turnips, and onions on board.

Turnips and onions, as long as they lasted, were put into the soup, and the potatoes, which lasted about six weeks, were issued for the crew twice a week. I have prepared special food, such as puddings and gruels for the sick men, and I have prepared fresh soup for them daily with vegetables from tins. I have taken sago or arrowroot to the deceased man Nicholas Case, and have seen him partake of it. I have known him to refuse rice which was good and properly cooked. The lime juice was issued daily, mixed, after the scurvy appeared, but previously it was given to the crew weekly in bottles. The water was good until the latter part of the voyage, when it was a little brackish.

The provisions supplied were all of fair average quality and quantity. Where a piece of meat was bad, it was replaced by the same quantity of good.

I have known coffee, tea, soup, &c., given to the African part of the crew; have heard them complain of the quality of the rice.

Fresh provisions were supplied to the crew daily in lieu of salt, and fresh vegetables were put in the soup whilst the ship was at Aden.

T. Whiston.

Statement of Mr. James Farr, Master of the "Princess Beatrice."

The ship left Cardiff on the 22nd of December 1869, for a voyage to Aden, with an ample supply of provisions on board, all of the best quality. No complaint was made to me during the passage to Aden of the quality of the provisions or water.

When in Aden, I supplied the crew with fresh provisions in plenty, including vegetables, as much as I could procure at that place; and on the passage from Aden to this port I gave them double allowance of lime juice after the breaking out of scurvy, and sufficient previously. My opinion is, that the cause of the breaking out of scurvy on board my vessel is that the men came on board in England in an imperfect state of health.

From the first symptoms of scurvy appearing I did all in my power to arrest the disease. The water I took on board at Aden was as good as could be procured there.

The old bread which was on board at the time of the purchase of fresh at Aden was taken out of the lockers before the new was put in.

James Farr.

Ann[illegible]

At a Naval Court assembled at Her Majesty's Consulat[illegible] [illegible]5th day of December 1870, to inquire into the causes of the breaking out of scurvy on board the British ship "Princess Beatrice," on her recent voyage from Aden, and of the death of several members of her crew, and also to ascertain what steps were taken to arrest the disease, and whether the Acts of Parliament have been complied with in this case, the Court, after a careful consideration of the evidence, is unanimously of opinion that the outbreak of scurvy was mainly caused by the continual issue of salt provisions, that a large proportion of the salt beef brought from England was of too low a price to ensure its being of good quality, and the quantities of antiscorbutics were totally inadequate for a long voyage.

A portion of the biscuit supplied to the crew for some time after leaving Aden appears, through neglect, to have become unfit for food, and was issued to the crew although good biscuit was on board. Lime juice was not issued in accordance with the Act of Parliament, and no efficient means appear to have been taken to arrest scurvy during the voyage.

The master, Mr. James Farr, for neglecting to comply with the 4th section of the Merchant Shipping Act, 1867, is hereby adjudged to incur a penalty of 5 *l.* sterling, and he is further adjudged to pay the costs of the proceedings of this court, that is to say, 4 *l.* sterling for fees of the clerk of this court for four days' attendance. Any expenses incurred, or which may be incurred, in respect of any of the crew now suffering from scurvy, the Court does further adjudge that the owners shall be liable for the same, in accordance with Section 7 of the Merchant Shipping Act, 1867.

The Court cannot separate without gravely censuring the said master for not providing a sufficient quantity of antiscorbutics, and the small attention shown by him towards preserving the health of the crew.

Given under our hands at Her Britannic Majesty's Consulate, Callao, this 15th day of December 1870.

C. A. Henderson, Her Majesty's Consul, President.
Wm. H. S. Bridges, Commander H.M.S. "Chanticleer."
Henry Hosken, Navigating Lieutenant H.M.S. "Chanticleer."
Maxwell Rodgers, Surgeon H.M.S. "Chanticleer."
James Dunlop, Master "Borneo."

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— No. 15. —

(M. 4122—1871.)

"ROBIN HOOD."

"Robin Hood."

The Superintendent at Poplar and the Seamen's Hospital Society, on the 11th April, reported several cases of scurvy on board the "Robin Hood;" Dr. Leach was appointed Inspector.

The following is his report, extracts from which were sent to the owners of the "Robin Hood." Their reply (inclosing a letter from the master of the vessel) is appended:—

(M. 3371.)

"Seamen's Hospital, Greenwich, S.E.,
30 April 1871.

"Sir,

"I have the honour to acknowledge the receipt of your communication, numbered as above, with Enclosures, having reference to the ship 'Robin Hood,' and to furnish a report in connection therewith.

"The 'Robin Hood' is a wooden ship of 941 tons register, and is the property of Mr. Vincent Stuckey, of Langport, Somersetshire. She sailed from London with a general cargo on the 7th of April 1870, and arrived at Bombay after a passage of 119 days; left that port on the 6th of October, arrived at Colombo after a passage of 10 days; remained there 40 days, and finally sailed for London, which was reached in 130 days from port to port. The crew outward bound consisted of 22 hands, all told, but five men were discharged in India, and an equal number shipped in their stead. Scurvy appeared among the crew about a month before the conclusion of the voyage, and when the ship arrived in the Thames two men were severely affected; both of whom had been in the vessel during the entire voyage. I visited the vessel in the East India Docks

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